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GARDNER
ON
STERILITY

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BY
Stephen Morrison M.D.

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PLATE I.

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THE

CAUSES AND CURATIVE TREATMENT

OF

STERILITY,

WITH A

PRELIMINARY STATEMENT

OF THE

PHYSIOLOGY OF GENERATION.

With Colored Lithographs and Numerous Wood Cut Illustrations.

BY

AUGUSTUS K. GARDNER, A.M., M.D.,

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NOT TO THE INVENTOR OF THE

CLAMP SUTURE,

THE CROWNING SURGICAL APPLIANCE OF THE AGE;

NOR TO THE PHILANTHROPIC PROJECTOR OF THE

WOMAN'S HOSPITAL,

THE NOBLEST CHARITY OF THE NINETEENTH CENTURY;

BUT TO THE MAN OF PRIVATE WORTH, TO

J. MARION SIMS, M.D.,

THIS VOLUME IS DEDICATED,

AS A TOKEN OF THE PERSONAL FRIENDSHIP

AND PROFESSIONAL ESTEEM OF

THE AUTHOR.

PREFACE.

For many years my attention has been almost undividedly given to the treatment of the various diseases peculiar to women, to parturition, and to its accompanying and succeeding maladies. From the many thousand cases in hospital and private practice, which have fallen under my observation, I have gathered experience, and, insensibly to myself, I have also formed opinions, which have grown, strengthened, and been verified by every day's labors. The result, in relation to one affection only, I propose to give in this treatise.

Impotency and Sterility are the names given to that condition of the sexes which makes a childless bed and matrimonial discords, which have changed the fate of nations, and the destiny of the world. Occasionally these conditions arise from a defect in the provisions of nature, almost always, however, are the consequences of disease. Sometimes the difficulties have been suffered to continue unchecked, till organic changes are effected, which can never be palliated. In the vast majority of cases, not only can they be alleviated, but the disorders can be entirely removed, and a most joyous result will not only bring proof of the cure, but will be

"A baby in the house, a well-spring of pleasure."

Impotency is the affection of the male parent, and will not be treated in this work. Sterility, or the barrenness of the female, its almost universal local cause, the means and certainty of its cure, will occupy the following pages. If the undoubted facts of my own experience, and the gathered wisdom of those of the past and present time, who have given their attention to this subject, shall be stated with clearness and force sufficient to convince the practitioners of medicine in this country—who are the depositaries of the secrets of so many families—and thus enable them to hold out a remedy for this gnawing worm in the bud of happiness, the purpose of this treatise will be effected.

New York, 141 East Thirteenth St.,
May 1st., 1856.

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THE

CAUSES AND CURATIVE TREATMENT

OF

STERILITY.

INTRODUCTION.

The economy and harmonious beauty of nature are nowhere more manifest than in the arrangement and operation of its reproductive organs. This is in accordance with the same disposition respecting the other organs. Take, for instance, the skeletons of the various creatures in animated nature—they have all one general type, and it is easy to note the resemblance. To create a bird, an animal, and man, nature did not construct three distinct forms, but modified this general type. The necks of the elephant, of the giraffe, of the owl, the goose, the fish, of man, are but varieties of

the same conformation, diverse as they may appear. The arm of the man, the fin of the fish, and the wing of the bird are formed upon the same model. In each may be found the (*scapula*) shoulder-blade; the (*clavicle*) collar-bone; the (*humerus*) single bone of the arm; the (*radius and ulna*) double bones of the fore-arm, with the bones of the wrist and hand more or less fully developed. Each, according to the duties required, is magnified or diminished. The clavicle of the man bears a very small proportion to that of the duck, and the wing of the flying-fish is but an hypertrophy of the fin of the ordinary fish, in itself a modification of the human hand.

To the careless observer, the ponderous shoulder and the short fore-leg of the patient, slow-moving ox have little to remind him of the light, slender, rapid-moving arm of the monkey. The student of comparative anatomy, however, speedily discovers their identity.

In the same manner, the organs concerned in the reproductive functions are identical. In every living thing there are the male and female structures, in a more or less developed condition. In every genus and species of sentient life, the new being is reproduced from an egg, the creation of a former parent.

For several reasons we shall endeavor to make this abstruse matter plain. First, because it adds another cause of wonder at the greatness and power of the

divine Architect of creation; it shows, not how great is God, but how small is man. Dr. Young once said that "an undevout astronomer is mad;" with greater emphasis it might be proclaimed, that a doubting anatomist was devoid of reason. It would seem as if man could not look down upon man, either as a whole, or in his apparently as wonderful integral portions, without being overwhelmed with the stupendous greatness of the Creator of all things.

Secondly—The method by which growth is effected, and still more, the manner in which a new creation is formed, is one that interests every person of whatever faculties or education. All men are curious by nature. They love to look into the interiors of even man's feeble constructions. The child seeks to discover the motive power in the watch; and man, but an older child, gazes at the movements of the steam engine and the spinning-jenny. A step higher, and the loftiest intellects of earth have spent their lives in analyzing the material body of man, in speculating upon his mental attributes, and in developing the hidden mysteries of his double nature.

Human energy has done something. It has discovered how we breathe, and the office of respiration; why we inhale air; why we expire it; what effect is produced thereby. It has discovered how the food is masticated, comminuted, changed to chyle, taken up by the absorbents, poured into the impure blood, purified in the

lungs, and its subsequent office. The formation, circulation, and intention of the blood are known. Science has carried this subject through from the beginning to the end. In other directions, science has made less progress—we know that the brain is the organ whence thought, sensation, and character proceed, but we know little of its methods of working.

The method whereby the various genera and species of life are perpetuated, is another branch of human inquiry, of which our knowledge is limited. Still, upon this point we are not entirely ignorant; but, notwithstanding the almost irrepressible desire of the human being to know somewhat on this topic, a false sense of propriety has attempted to ignore this subject, and the ardent investigator has been compelled to turn to the fanciful statements of ignorant and credulous pretenders to science, to satisfy his cravings for knowledge. This subject is, therefore, here enlarged upon, because there is no treatise in our language upon this subject, which gives a correct statement of the knowledge of this century, and of the present decade.

Thirdly—It is necessary, for the purposes laid out in the design of this work, to state in what nature consists, that the deviations from nature may be made clear and palpable to the intelligent understanding, for without both of these points being lucidly perceptible, the means here proposed for the correction of these deviations will

not be firmly impressed upon the mind. In other words, unless the reader fully knows what is health, and what disease, he cannot understandingly perceive what is the remedy and why its potency.

I.

PHYSIOLOGY OF GENERATION.

Following the same laws shown in the development of the different forms of animated nature, the reproduction of the species is effected in the same manner throughout creation. Reproduction consists in the growth of an ovum, egg, germ, seed, or embryo in a living part, from which it is separated when capable of independent existence. The females of plants and animals supply the germ, while the male affords a fructifying fluid.

In plants the existence of distinct sexes is well known, and the method of their union and their fecundation, by means of the pollen, has long been observed, and horticulturists have availed themselves of this knowledge to raise varieties of fruit at their option; all that is necessary being to shake a blooming branch of the male over the flowers of the female.

The same thing is now being effected in this country with the fish tribe, after the plan of Mons. Coste, the distinguished embryologist of the College of France, Paris.

The fecundation of the fish ovum is almost as free as the seed of the plant. The female deposits her eggs, and the male finding them, ejects the fructifying principle, pertaining to his sex, upon them; both leaving them afterwards to chance. Mons. Coste discovered that by taking the female, and by gently pressing, he could cause the eggs to be discharged into a vessel prepared for the purpose, and that by treating the male in a similar manner, the seminal principle was also discharged. Then by gently shaking them together, placing them in proper situations, the egg was fecundated, and innumerable fish were thus propagated.

In the higher types of animal life fecundation is not so easily effected, but throughout all nature, the essential principle is the same. The female furnishes the germ, egg, embryo.

In the female of most, if not all animals, this germ is afforded only at periods of greater or less intermediate intervals. In the greater animals, the horse, cow, deer, elephant, camel, many birds, this period occurs but once a year; with the cat and dog species, twice or three times, and with the rabbit and domestic fowl, it is much more frequent. This season is termed time of heat, rutting period, &c.

With the human female, the general opinion has been that there was no particular period, which is unquestionably an error. It is almost demonstrated that the woman is never impregnated, except for a

short season immediately subsequent to her menstrual discharge. That they are more apt to conceive at this period, was noted so long ago as the life-time of Pliny, who, in his Zoology, says: "Conception is generally said to take place most readily either at the beginning or the end of the menstrual discharge;" and we are informed by the French historians "that their king, Henry II., and his wife, Catherine, having been childless eleven years, made a successful experiment by the advice of their physician, Fernel; intercourse immediately after the cessation of the periodical discharge, proving fruitful."—*Lemaire*, vol. iii., p. 83, also William Harvey in 1651, in his work "*On Birth and Conception*," says: "Wherefore, their terms being now at hand, or nearly over, whilst the warmth and moisture of the part (which are the necessary causes of generation) do remain, women are most apt to conceive."

Says Pouchet (in his "*Théorie Positive de l'Ovulation Spontanée*, Paris, 1847, p. 274, 275), "But as we have recognized that the decidua always is destroyed from the tenth to the twelfth day of menstruation, it consequently results therefrom, that conception cannot take place except during the ten days subsequent to the appearance of menstruation, and that it can never take place after this epoch." Bischoff, Courty, and other eminent physiologists, recognize this statement as correct. The occasional exceptions when

pregnancy occurs later, are accounted for in some other satisfactory manner, which has been alluded to in another place. Certain it is, however, that in the vast majority of cases, conception takes place only after menstruation, although the length of this period is variously prolonged. This season is in almost every respect analogous to the heat of animals. The outward signs are distinctly perceptible. The bitch in heat has the genitals tumefied and reddened, and a bloody discharge. The human female has nearly the same; and although she may possess sensual appetites at other periods, they are notoriously heightened, somewhat anteriorly, and very manifestly immediately subsequent to this epoch. Of this fact I am fully convinced from the testimony of very many females who have replied to my questions, asked of them in order to elicit the facts upon which I have based the theory enunciated in this treatise.

A medical army officer, according to the *Am. Med. Monthly*, says: "The Indians of Puget Sound have a season of amorousness affecting both sexes—from May to October, most active in June—corresponding with the salmon-eating season. The remainder of the year they are cold and without passion."

It is from a generally wide-spread error upon this point that it is deemed necessary to insist with some earnestness upon this particular. The tables compiled by Churchill and others, in order to determine the time of the duration of gestation, also prove this fact, which

will hereafter be more fully alluded to. The point to be borne in mind is, that the human female is capable of being impregnated only for a few days every four weeks, subsequent to her usual menstrual periods.

One fact should be most particularly noted, that the regular monthly bloody flow is always excited by the discharge of an ovum—that no other hemorrhage ever occurs periodically—and as a consequence, which admits of no exception, *every woman who regularly menstruates is capable of being fecundated* under certain conditions.

The fecundation of the ovum in accordance with the providence of nature, is the same with all animated creation. It is simply the union of the male-vivifying principle with the ovum of the female, in a proper and natural situation.

In the allusion already made to the procreation of fish, all that was done was in accordance with this statement. The ovum of the fish in water was mixed with the seminal principle of the male ; both being in a sound physiological condition. All that was unnatural was the manner in which the union was effected, and this, as will be seen, is unimportant.

Dr. Silas Hibbard of New Hampshire, has recently advanced the theory in the *Buffalo Medical Journal*, Sept. 1850, that males are conceived shortly before the

time of the courses, and females after. The theory is, that there is generally a periodical development and maturation of an ovum near the time of the courses, and that said maturation usually bears the same relation to the time of the courses in all women, and thus they are ordinarily more susceptible of impregnation shortly before and shortly after menstruation, and also that this susceptibility is nearly equal at both these times. His theory further is, that the same ovum, if fecundated shortly before the courses, will generally grow to be a male, while if fecundation is deferred till after the courses, it will generally grow to be a female.

Apart from the very loose and vague manner in which, unsubstantiated, this statement is made, it is contrary to general opinion, which is worth something when no argument is brought against it.

In regard to the production of sexes at will, many unsupported theories are advanced—one, that the right ovary produces males, and the left females, a fact frequently disproved, not only by the birth of twins—where the placenta and membranes show whether one or both organs were concerned in the creation—but also by the numerous failures of those females, who, following the propositions of the theory, assume a position either upon the right or left side, immediately subsequent to commerce.

Many curious investigations have been instigated in regard to this point in the world of nature. It is a

matter of familiar knowledge that the male and female characteristics of the higher species of the animal creation are not produced in the same individual as they are in the great majority of the higher species of plants. The organs, as will be seen, from which the two are evolved, are, however, so nearly related to each other in intimate nature, that the one may be readily mistaken for the other in the earliest period of their formation. Physiologists now incline to the opinion that the fertilizing vesicle is merely a germ vesicle, in a somewhat more exalted stage of development. Mr. Knight has shown that plants, like the oak, that bear the male and female flowers on separate individuals, may be made to produce either at will, by regulating the supply of light and heat according to the end in view. If the heat be excessive as compared with the light, male flowers only appear; but if the light be in excess, female flowers are produced. He also found that, whenever the eggs of birds are not allowed to be fertilized until immediately before they are laid, and therefore, their own intrinsic development has been carried to the highest possible pitch before renewed vivification of the germ vesicle is effected, as many as six out of every seven of the birds subsequently hatched proved to be males. This view would seem to corroborate the opinion entertained by Dr. Hibbard.

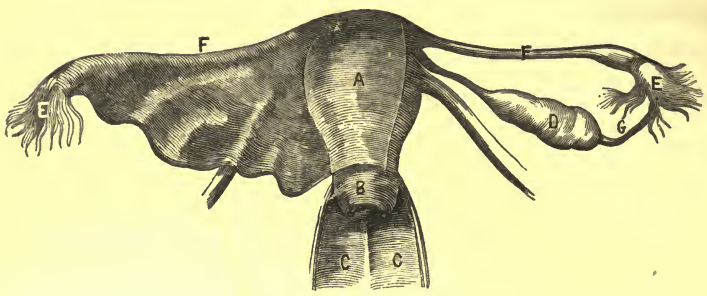
Quetelet believes that the relative ages of the male

and female parent, influence the sex of the offspring produced, to a very considerable extent. In support of this theory M. Hofacker has shown that when the father is considerably younger than the mother, the proportion of female to male children is generally as ten to nine ; but that when, on the contrary, the father is nine years older than the mother, the proportion of male offspring to female is as five to four, and when eighteen years older, as two to one.

In a general way, more males of the human species are born into the world than females. If all Europe be included in the estimate, the proportion of male to female births is about 106 to 100. Possibly, if Quetelet's views be based on truth, this preponderance on the side of the males may be due to the fact that in civilized communities men, from prudential and other motives, mostly marry women younger than themselves. But there are other reasons why this preponderance exists. Three male children are born dead to every two female.

But before proceeding further we will describe the ovum and the male virile life-giving principle according to the opinions of the day, as proved by the investigations of Bischoff, Coste, Donné, and other distinguished physiologists and microscopical observers. And first, to render this clear, a brief recapitulation of the leading anatomical characteristics of the generative organs will be expedient.

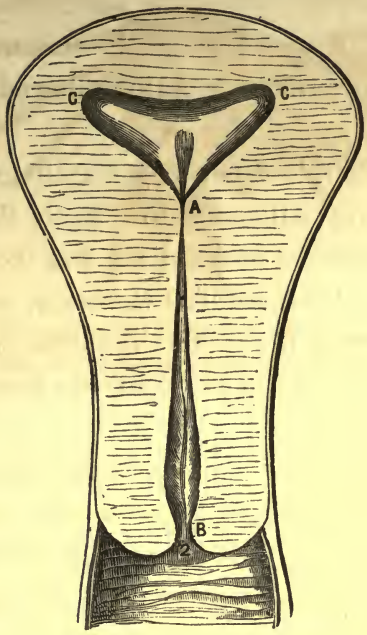
Fig. 1.



A is the body of womb, B the cervix uteri, CC the vagina, D one of the ovaries, EE the fimbriated extremities, F the fallopian tube, G the small ligament attaching the fimbriated extremity to the ovary.

The uterus, or womb, is a pear-shaped organ, in its unfecundated, healthy state, about two inches long and one wide. Its normal position will be seen by reference to Plate II. It has long been divided into two portions in common parlance, but not until quite recently have these two parts been recognized by the anatomist and physiologist as two distinct divisions of the same organ in its anatomical character, in the distribution of its nerves, and in its functions. The knowledge of these two distinct characters is most important to the accoucheur and still more to any one engaged in the treatment of all uterine diseases, and especially of sterility. The consideration of the peculiar functions of these will form a part of the practical portion of this treatise; all that is to be here noted is the duplex character of the womb.

Fig. 2.



The uterus divided longitudinally, showing its interior cavity. A is the os internum uteri, B the os externum uteri, CC the horns from whence spring the Fallopian tubes, A to B the canal of the cervix.

Through the centre of this oblong organ runs a cavity. In the body of the organ this cavity is of a triangular shape with the base resting upon the fundus of the uterus, while from each corner the canal is continued. Those at the base are the Fallopian tubes, which end in the "fimbriated extremities," and are usually floating loose in the cavity of the peritoneum. The opening at the lower corner of the triangle is the

canal of the cervix, and when of natural size and without disease, *will not* allow an ordinary Simpson's uterine sound to pass through it without pain and a very decided pressure, generally followed by a bloody flow.

The shape of this canal is generally misunderstood. By most it is supposed to be of the same size throughout. Bennet first noticed the incorrectness of this opinion, and half rectified the error, by stating that the interior orifice, i. e., where it enters the body of the uterus (A, Figure 2), was manifestly smaller than the

FIG. 3.

FIG. 4.

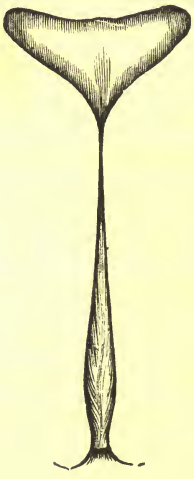


Fig. 3 represents the cavity of the uterus, according to Quain and the older anatomists, the os internum not being recognized, and contrasting markedly with Figs. 2 and 4.

general calibre of the canal.* So far he was correct. *It is equally true that the external orifice is, in virgins, when no disease has existed, also smaller than the cavity within*, with difficulty admitting a small probe.

The anatomy of the canal of the cervix, therefore, evinces that this passage is short, of about one and a half inches in length, of an equal size throughout, except at the external and internal orifices, and in its healthy, virgin state, and when not menstruating, no *instrument* of any size *can be passed into* the cavity of the uterus without injury to the living membrane. A large instrument cannot be passed without force, and a small one will seriously lacerate and puncture the mucous membrane.

I will here mention, what may perhaps be again alluded to, that both of these organs—dividing the body and cervix into two organs—are muscular, and both susceptible of being irritated and provoked to muscular contractions. This has always been recognized of the body, but not so generally of the cervix. But this may easily be noted by those treating uterine disease. It was markedly perceptible in a case on the morning of the day on which I write these words (May 30, '55), when attending a female for sterility, at the

* The opening of the os uteri is of considerable size, and is named the orificium uteri externum; the canal then becomes narrowed, and at the upper end of the cervix is contracted into a smaller opening, the orificium internum.—*Anatomist's Vade Mecum*, by Erasmus Wilson, fifth edition, London, 1851.

Northern Dispensary; I invited my friend, Dr. E. B. Warner, to witness the operation. I passed a loose piece of nitrate of silver, about three quarters of an inch in length, into the cavity of the cervix, by means of a long pair of forceps, and as fast as it was introduced and there left, it was immediately pushed out by the contractions of the neck of the uterus, and with so much force as to be thrown out of the vagina. This demonstration of the foregoing statement was most satisfactory.

Fig. 5.

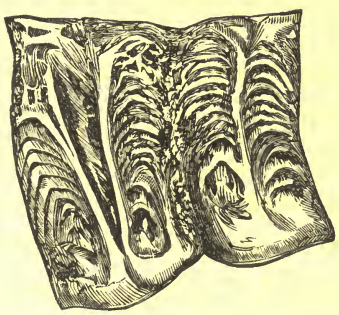


Fig. 5 represents the cervix uteri, divided longitudinally, and folded back upon itself, displaying the peculiar structure of its internal living mucous membrane, which, from the arrangement of its folds, is denominated the arbor vitæ. This formation, materially modifying and affecting the treatment of difficulties in this situation, will be more fully enlarged upon in succeeding chapters of this work.

Attached, on each side of the uterus, on a level with

the fundus, are the ovaries, the internal testicles, as they were formerly considered, and are now popularly called.

From the upper portion of the uterus, connecting with the upper corners of the interior, the angular cavity before alluded to, spring the fallopian tubes, terminated by their fimbriated extremities, which are sometimes attached to the ovary by a slight ligament.

THE FUNCTIONS OF THE FEMALE ORGANS OF GENERATION.

"From the commencement of puberty up to the period of involution, the ovaries are the seat of a *continual detachment of the ova by dehiscence of the Graaffian vesicles*, which, independently of sexual congress, takes place in women and virgins, above all at the menstrual period, although it may and does frequently occur at other times, under conditions not yet accurately determined."

The recent examinations by Prof. Bischoff, of the organs of generation of thirteen women who had died suddenly by violence while menstruating, throw some light upon the subject.

Prof. B. remarks that these cases confirm the doctrine that, in women, at every menstruation, a follicle ripens, swells, and bursts, that the ovum escapes, and that a corpus luteum is formed. The eleventh case

seems to prove that the full consequences of menstruation are not, in every instance, fully carried out, but that a follicle may swell, and the ovum ripen, without the bursting of the follicle, or the escape of the ovum. Such a condition will cause sterility, notwithstanding menstruation. Perhaps, also, the pain of the menstrual period depends upon the incomplete development.

A woman may not menstruate, and yet she may conceive; for the essential condition, the ripening and escape of an ovum, may proceed, and only the usual outward symptoms of this event, the secretion of blood, fail.—*Henle's & Pfeufer's Zeitschrift*, 1853.

At the appropriate season the shad discharges her eggs upon the waters, trusting that they may be found and fecundated by the male; the domestic hen, at proper intervals, prepares a batch of eggs, which, when sufficiently matured, she "lays," whether they are or not fecundated by the cock. In like manner, the ovaries of the human female, at her regular periods of four weeks, take on action and discharge one or more eggs, if a virgin not to be fecundated, if in the habit of sexual intercourse, to be or not fecundated, as other circumstances may affect.

The process of menstruation is the laying of a human egg, differing little in its general characteristics on its first appearance, from the egg of a cow, a dog, or a bird.

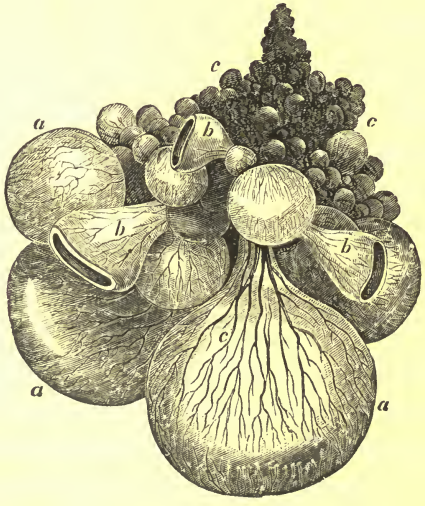
The menstrual discharge is a mixture of blood and

glandular albuminous secretion. The act of menstruation is one in which the whole genital apparatus sympathizes, if not the entire constitution. The ovisacs, i. e., the sacs containing the ova, usually called the Graafian vesicles, are contained within the substance of the ovary. These enlarge during the month, and in their growth, approach the exterior of the ovary, till having arrived at the period of maturity, the sac bursts, and borne on by a flow of blood accompanying this breaking, the ovum is floated down the canal of the Fallopian tube, the fimbriated extremity of which, concealing the open mouth of the canal, has, warned by the general uterine disturbance, been closely applied to the ovary, ready for the coming ovum. The egg is speedily wafted through this canal into the cavity of the uterus, which transit it accomplishes, according to Pouchet, in from two to six days. This organ also, forewarned of the coming of the ovum, is in a high state of turgescence, and the numerous follicular glands which stud its inner surface, and are continued through its neck, throw out an abundant supply of mucus, glandular, semi-albuminous discharge, and sometimes blood exudes from the turgid vessels lining its surface. When this exhalation is limited and natural in its character and quantity, it forms a membrane, lining the interior of the cavity of the uterus, which is called the decidua, and in certain cases of Dysmenorrhœa, or painful menstruation, a similar membrane, or oftener membranous threads and strings,

are discharged, which are considered to be semi-organized fibrinous secretions, from the internal surface of the uterus.

If from any diseased action or extraordinary congestion of the parts, the flow of blood and glandular secretion is unusually profuse, then the ovum may be washed away, and with the menstrual discharge, be borne out and destroyed. But if the discharge be of moderate quantity then in the cavity of the uterus, this ovum, caught in some fold or cell, may remain until its vitality is lost, and like all effete matter of the system, it is voided.

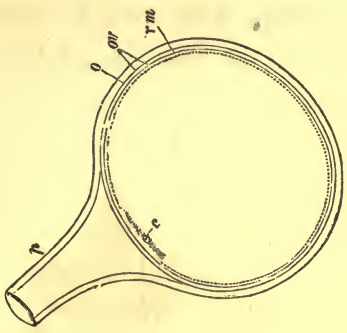
FIG. 6.



This physiological action is easily traced in the ovary of birds. In Figure 6 we have a representation of the

ovary of a fowl, *a a a* are nearly mature ova contained within their bags of investing membrane; *c c* are young ova in their earlier stages of development; at *b b b* ruptured bags are seen, from which mature ova have escaped. In Fig. 7, the position of the several parts of a matured ovum are represented in outline; *p o* is the thickness of the ovarian bag; *o v* and *r m* are

Fig. 7.



the proper investing membranes of the ovum, and *c* is the small germ vesicle lying on one side of the large yolk mass, to which reference will hereafter be made.

The ovum quietly remains within the uterus, awaiting the fecundating principle of the male. In some insects, with the providence which lays up for a day of need, the spermatic fluid received at some anterior period, is retained in a place set apart for this purpose, until the ovum be formed. In a certain degree, this may also be the case with the human female. The

vivifying principle may lie awaiting the coming ovum, for a day or two anterior to the period of menstruation, and this opinion is sometimes apparently made probable by delivery occurring at a period corresponding to the commencement, rather than the cessation of the menstrual discharge. Bischoff says, that in all his observations upon mammalia, he knows of no instance where conception occurred after the egg had reached the uterus, and that the inclusive time of possible impregnation is that from the discharge of the egg from the ovary until it reaches the uterus, and this is considered by him to be but ten or twelve days.

These views are directly opposite to those in vogue some twoscore years ago. The doctrine of those days was, that the ovum was discharged at the time of sexual intercourse, and at that time only—that the ovum was in fact the result of the female orgasm, in the same manner as the seminal fluid was the result of the male orgasm. Sir Everard Home, the great physiologist of past days, even, stated that he saw the human ovum four days after union, of which he considered it the direct result.

The secretions of the female genital organs, except those of the ovarium, are, 1, a whitish mucus in the uterus and vagina, which in the former is derived chiefly from the uterine glands, the distinctions of which are mentioned elsewhere; 2, a transparent viscous albuminous mucus in the cer-

vix uteri; 3, the clear, viscid secretion of the Bartholinian glands, which is poured out in large quantity in copulation; and upon excitation, as was noticed by Hugier and Scanzoni, it even frequently escapes in jets, which may be ascribed to the muscles of the excretory ducts; 4, the secretions of the minute sebaceous and mucous follicles of the external organs.—(*Kolliker.*)

In order to more clearly demonstrate this subject, I will here epitomize the present generally received "cell theory" of growth and reproduction.

According to the researches of the celebrated comparative physiologists and microscopists of the present day, into the philosophy of growth and reproduction, it is demonstrated, as first pointed out by Schwann, that at the bottom of all vitality is a microscopic atom, which is alike found in every living thing, from that of the highest to that of the lowest organization. It is found in the sap and in the leaf, in the blood and in the bone. So minute are they in their most attenuated state, that twenty millions could be located on a five cent piece. This omnipotent pigmy, this type of life, assumes a great variety of appearances, but in all possessing the same essential construction, and the same general form. Its generic name has been *Cella*, a cell, or little chamber—a place provided for some store. A more acceptable title, and one which is destined to supplant the former, is *vesicula*, or vesicle.

A cell is a hollow space ; a vesicle is a little bladder, and such we find this essence of life to be.

The vesicle of organized structure consists of a filmy layer of delicate membrane, rolled up into the form of a bladder ; or, still more correctly, of a hollow ball, the interior cavity being everywhere closed from external space. This cavity always, however, contains some kind or other of material substance. The matter contained within the vesicle is introduced by transudation through the apparently poreless membrane. Dutrochet was one of the first observers of this curious process of transudation through organic membranes, now known by the term "*osmose.*" This is the simple type of all vitalized creation.

The increase of these vesicles is seen in the earliest states of a simple plant, the liverwort or anthoceros. The delicate film is so transparent as to allow the substances contained in it to be easily perceived. This substance is a thick liquid, in which a great number of minute opaque globules float about, among which is one larger body, Fig. 8, *a*, which first makes its appearance

Fig. 8.

as a speck, which soon assumes more importance by attracting to itself portions of the surrounding mole-

cules, and attaching them to its own substance ; in short, it grows until it becomes itself a hollow structure, like to that in which it is held, save in size. It is then a vesicle within a vesicle—a kernel to the vesicular nut, and on this account is called the *nucleus*. For a certain time, both the larger and smaller vesicle increase together, but at length this process of growth is arrested, and streams of the finer granules begin to flow backwards and forwards between the outer wall of the vesicle and the imprisoned nucleus, and a very delicate filmy lining is soon perceived to be separating itself within from the wall of the vesicle, and to be extending a fold inwards towards the kernel, in the form of a flattened ring. This delicate lining appears to be a structure of great importance, and is called by Mohl, the German physiologist, the "primordeal utricle," or the "original little bag." This inward fold of this living membrane at last constitutes itself a complete partition across the vesicle, cutting the kernel also in half. Fresh cell film is then produced by it within its own fold, and the first vesicle is thus metamorphosed into two. These then both grow in their turn, form new nuclei in their interiors, develop partitions, and again divide, and thus in a similar manner *ad infinitum*.

In Fig. 9 the condition of the cell drawn in Fig. 8, is shown, after four partitions have been developed, and four distinct cells have been called into being (one of them is on the farther side of the object, and invisi-

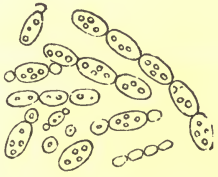
Fig. 9.

ble, in consequence of lying beyond the focal reach of the microscope).

Vesicles which are thus multiplied by splitting into pieces, are called *fissiparous;* that is, producing by fissure or division.

Vesicles are sometimes multiplied by the formation of external buds, and are called *gemmiparous.* The delicate lining of the parent vesicle, instead of growing inward into its cavity as a partition, is pushed outward, carrying a sort of pouch of the external cell-wall before it; and this pouch by degrees, gets nipped by a narrow neck of communication, and at last falls off completely, as a distinct offset or bud. The parent vesicle is then not resolved into two new ones, as in the cases described above, but forms a young one.

Fig. 10.



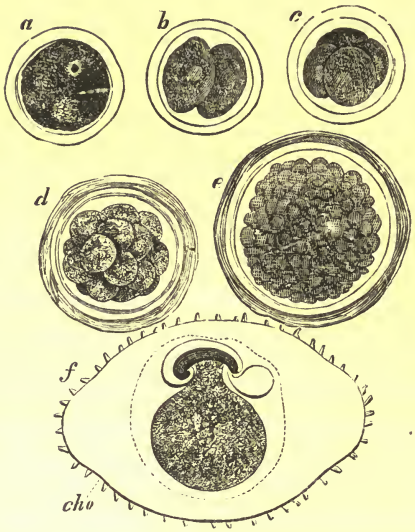
This process is seen in the yeast-cell, Fig. 10, magnified many thousand times.

Both plants and animals, in their most rudimentary forms of living existence, agree in certain important particulars. They are both isolated vesicles of membrane, possessing the power of absorbing fluid nourishment into their cavities, of growing to a certain extent out of the material thus acquired, and of then forming a brood of living vesicles, in all respects like to themselves.

Every animal, be it what it may, the colossal elephant, the majestic lion, the lord of creation himself, all commence their terrestrial career as simple monads; they are all unicellular creatures before they assume their more dignified and complex conditions. Man begins life as a small membranous vesicle, full of fluid; *c*, in Fig. 12, page 40, is a picture of his important person in the primeval stage of its existence! In *a* the primary vesicle is shown, contained within the parent cell; and in which is also a quantity of food for the early nourishment of the young creature; in *b*, the protecting case is broken, and the germ vesicle, with its environing nutriment, has escaped from the ruptured cavity. This vesicle absorbs through its walls the nourishment that is furnished for its use, and then begins to divide and subdivide, as already described (*Page* 35), into generation after generation of other vesicles, as may be seen in Fig. 11, *a*, *b*, *c*, *d*, *e*.

At first, the multiplying brood remains in communication with the body of the parent animal, and all the

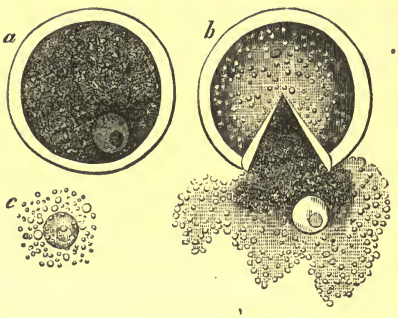
Fig. 11.



material that is required for the support of the multiplication is derived from the parent blood, but subsequently this connection is dissolved, and thenceforth the developing individual has to cater for itself. A digestive apparatus is brought into play, and nourishment is prepared by it from various sorts of food, from the substance of which the new broods of vesicles draw their material. The various subdivided vesicles unite in divers ways, to build up the organic body of the individual. Some get encrusted with earthy matter, and are piled together to form bones ; others ooze a gelatinous product through their walls, multiply therein, and then set themselves fast as cartilages ; others coalesce into tubes ; others arrange themselves as the contractile

fibres of muscular flesh; others assume the form of nerve-threads and nerve-cells, &c., &c. In *f* of Fig. 11, the growing mass is represented as it appears after its moulding into a definite organic shape has been commenced; and the appearance of the new creature has begun to be assumed—*cho*, indicating the already commencing chorion, with its shaggy tufts. These germ vesicles of the animal frame are developed in a mass of condensed vesicular structure, provided for their structure, and termed, as before described, the ovary. Large, distinct vesicles are formed here and there in this mass; and in each of these a true germ-vesicle slowly makes its appearance, and gradually surrounds itself with nutritious particles of an albuminous and oily nature, attracted out of the neighboring blood-vessels; the whole then gets covered by an external membranous investment, and becomes what has already been designated as an ovum or egg. The outer protecting coat of the ovum is called the *ovisac*, or egg-bag. When the ovum is quite mature, and the germ-vesicle is prepared for fertilization, the wall of the developing vesicle dissolves entirely, or is ruptured in some part, and the ovum escapes into a channel provided to carry it away. In Fig. 12, *a* is the representation of a mature ovum, containing a germ-vesicle and nutritious particles. At *b* the coats of the ovum are burst, and the germ-vesicle is seen falling from the cavity. See in this connection *b*, *b*, *b*, in the ovary of the fowl, Fig. 6.

Fig. 12.



The fecundating principle, the sperm, the spermatic fluid, or, in scripture language, the seed, is a composite substance. The greater portion consists of mucus, the secretions of the numerous glands which line the urethra, the prostate gland, &c., and the secretion of the testicles, which last is the true spermatic, life-giving emanation.

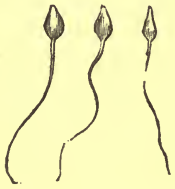
Its composition, according to the analysis of Vauquelin, is

Water,	900.
Animal mucilage,	60.
Soda,	40.
Phosphate of lime,	30.

This true semen forms but a small portion of the fluid ejected from the urethra during coition, and this muco-glandular discharge is necessary not only to give sufficient bulk to be effectually ejaculated by the ducts, but also is all-important to dilute the concentrated true

semen. "The true semen, of which we have given the chemical analysis, as found in the vas deferens, is a whitish, viscid, inodorous material, consisting almost entirely of fertilizing vesicles, or spermatic filaments, and containing between these bodies an extremely minute quantity of connective fluid. * * * * * In the pure semen, the filaments exhibit no *movements*, or scarcely any, when it is too much concentrated. The movements are first visible in the contents of the vesiculæ seminales, and in ejaculated semen, or when pure semen is diluted."—(*Kolliker.*)

FIG. 13.

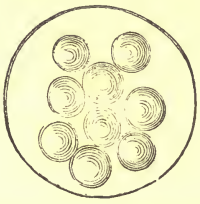


The fertilizing vesicles, spermatic filaments, animalcules, *fila-spermatica*, *spermatozoa*, Fig. 13, were first discovered by a German student, Louis Hamon, August, 1677, by whom they were shown to Leeuwenhoeck, who first made a study of them. They are perfectly homogeneous, soft corpuscules, in which are distinguished a thicker portion—the body or head—and a filamentary appendage—the *filament* or *tail*. The former is flattened, and viewed on the side, pyriform, with the acute

end in front; on the surface, oval, or even rounded anteriorly, and also, though more towards the anterior part, slightly capped.

The development of the fertilizing vesicle of the animal is after the same manner as the germ-vesicle. Large cells are especially set apart for the purpose, in which are gradually formed several nuclei. These nuclear cells then grow and mature, until they become complete hollow vesicles. Fig. 14 is a representation of one of the large developing cells of the fertilizing vesicles of the sparrow, with its brood of young vesicles in the interior. But when the interior vesicles have completed

Fig. 14



their growth, a change begins to take place in their interior cavities also. An opaque granular matter, which they contain, is moulded step by step until it has assumed a very peculiar form. A small, egg-shaped body, with a long coiled-up tail, is slowly shadowed forth from the cavity of the vesicle, and grows more and more distinct.

In Fig. 15, this tailed body is seen at *b*, still snugly lying in the midst of the formative granules; and in

the right hand sketch, with its structure perfected, the bed of granules being all consumed, and nothing being

Fig. 15.

left around it but the transparent walls of the prison. At *a* the tail projects through the walls, which seems to be a preparatory step to the complete emancipation of the prisoner. These figures are taken from the developing cell of a quadruped. This peculiar little body, with the egg-shaped body and curling tail, will be recognized as the "spermatic filament," as shown in Fig. 13. According to Dr. Burnett, our distinguished countryman, lately deceased, the spermatic filaments are not formed, as stated by Kolliker, by a deposit from the contents of the sperm-cell or nucleus, but by an elongation of the cell or nucleus itself. It will be observed that its development is an affair of three generations successively. First, the developing cell is made in the midst of a cellular mass. Then this cell perfects its brood of secondary vesicles (*Fig.* 14) and next, each of these vesicles produces (*Fig.* 13) the final object of the process—the true fertilizing agent, the spermatic filament, or fertilizing vesicles.

The movement of these bodies is effected solely by the alternate flexure and extension, or serpentine motion of the filamentary portion, or tail, in which way are produced such lively and various undulating, rotatory, quivering changes of place—during which the head or body always precedes—that these elements of the semen were formerly regarded as animals.

The duration of these movements (i. e., the life of the spermatozoa, or fertilizing vesicle), depends upon various circumstances. In the dead body they are not unfrequently perceptible, even twelve to twenty-four hours after death (on one occasion Valentin noticed faint motion at the end of eighty-four hours), and in the female genital organs of the mammalia, they exhibit motion even after seven or eight days (*Leeuwenhoeck, Prévost and Dumas*). Water at first renders the motions more lively, but they soon cease, and the filaments are not unfrequently curved in a loop-like form. Blood, milk, mucus, pus, syrup, and a dilute saline solution, have usually no injurious effect; but it is otherwise with urine (*Wagner*) and bile, the former particularly, when it is strongly acid or much diluted. All chemical reagents, acids, metallic salts, caustic alkalies, &c., cause the motion to cease, as do narcotics, when they act chemically upon the filaments, or are too much diluted; especially uterine mucus, of a decided alkaline character, is destructive to their vitality. (*Donné*).

The formation of the spermatic filaments and of the semen, it is true, usually ceases in old age, although they are not unfrequently found in men of sixty, seventy, or even eighty years of age, and even accompanied—though this, it must be confessed, is an unusual phenomenon—with the procreative faculty.

"That the *seminal filaments* are not *animalcules*, but elementary parts of the male organism, it is useless, at the present time, to demonstrate (Leeuwenhoeck and Spallanzani, insist that they are animalcules. Ehrenburg considers them among the microzooaires suceurs, while Czermak, placing them among the infusoria, classes them among the vibriones and the cercaires. Indeed, the former saw stomachs and intestines in them, and Schwann and Henle made the important discovery that they had mouths) although it is still as much as ever unknown, and may not easily be soon ascertained what is effected by their curious movements, which are obviously intended to convey them to the *ovum* from the *uterus*, which they probably reach in fruitful congress. Nor, from the experiments of Prevost, Dumas, Schwann and Leuckart, can the least doubt be entertained that they are the true impregnating agent, and for the purpose of impregnation must necessarily come in contact with the *ovum*. The circumstance that motile spermatic filaments alone possess the fertilizing property, and according to Newport (*Newport Phil. Trans.*, 1851, I), that the effect upon

the *ovum* takes place immediately upon the contact, although a short duration of the contact of the spermatic filament with the *ovum* is necessary to render it efficient, also shows, as it appears to me, that they do not act by affording any material substance to the egg, but in consequence of their exciting actions in it, as bodies in a state of peculiar activity."—(*Kolliker*).

According to Mr. Newport's researches, impregnation is effected by the spermatic cilia alone, and not by the agency of the liquor seminis. It was found that when the seminal fluid was filtered, so as to separate the spermatozoa almost entirely from the liquor seminis, the impregnating power of the spermatozoa was immense, while that of the liquor seminis was very small, and commensurate only with the small number of spermatozoa which had passed through the filter. When the spermatozoa were entirely separated, the liquor seminis was found quite incapable of impregnating ova.

According, therefore, to this statement, the most modern received opinion, the vivifying principle is a spermatic filament or vesicle, which must come into contact with the *ovum* of the female, when, by some as yet undiscerned manner, a new life is the result, possessing marked properties and characteristics, often indicating the persons from whence each portion come.

IN WHAT MANNER DO THESE ELEMENTS UNITE?

In the act of copulation the virile organ, in ordinary cases, penetrates into the vagina to the distance of from three to four inches, and upwards, or to such a distance that the *corona glandis*, or the extremity of the organ, is in immediate approximation with the opening of the uterine canal, the *os uteri*. Here the spermatic fluid is discharged

According to most physiologists, the active labors of the spermatozoa here commence, which accordingly, as if imbued with a knowledge of its duties, or pressed forward by instinct, commences to make its way through the patulous mouth of the uterus, into its cavity, and not finding the ovum there, prolonging its search through the length of the Fallopian tubes, even to the ovary itself. Some microscopists have recently asserted, that they had seen the ovum just emerging from the ovary, already surrounded by the spermatozoa rapidly moving around it, and embracing it; others, that they had noted the ovum transfixed by the spermatozoa, the head being imperceptible, and the tail alone noticeable, quivering with evident vitality.

A popular opinion, but which has attained currency without foundation upon which to base it, that I am aware of, declares that in the act of copulation, at the

time of the "crisis," or height of venereal sensation on the part of the female, the mouth of the womb *opens* to receive the Danæan shower, and the spermatic fluid is ejected immediately into the cavity of the uterus.

So little is known of the os and cervix uteri in its minute anatomy, and its physiological action and sympathies, either in a healthy or a diseased state, that there may be some truth in this opinion.

Kolliker states: "It is probable that movements take place at the time of menstruation, and in the act of congress, but the fact has not been ascertained. In the latter case, an opening of the os uteri, and a dilatation of the canal of the cervix are commonly supposed to take place. If this is to be regarded as a spontaneous action of the cervix, it would be justifiable, with Kiwisch, to refuse assent to the supposition, for the radiating fibres described by Kaspar, which alone could effect anything of the kind, do not exist; the fact, nevertheless is conceivable, if we assume a relaxation of the muscular element in the cervix and os, together with a contraction, especially of the longitudinal fibres, in the fundus and body."

It is further added, that in order to fecundation, it is very important that the female should participate in the excitement and pleasure of the act, for without such participation the os uteri remains closed, and the female childless.

To this impassionless performance of the act from

personal repulsion to the male, is ascribed the fact, that women raped, and virgins forcibly deflowered, are rarely impregnated—why women are childless with their first husband, and fruitful with a succeeding one.

The fact that many women are passionless, and yet have sometimes very large families, or that women brutally forced are occasionally impregnated, seems to controvert the general theory upon this subject. (I am personally acquainted with a physician and his wife, who have a large family, increasing rapidly by the addition of one a year, where the female never has experienced any sensual gratification, as the husband states.) I shall have occasion to refer to this view when treating upon the cure of barrenness.

Some have argued that the spermatozoa possessed an instinct which compelled it to seek for the ovum, from the fact that it was not necessary for the seminal fluid to be thrown into contact with the os uteri. The virile member is occasionally so diminutive as not to extend more than an inch and even less into the vagina ; from the effect of stricture, the power of ejection is greatly diminished. so that the semen is not thrown far into the canal ; that from congenital malformation, hypospadias, or the consequence of accident, the opening of the male urethra, is sometimes upon the lower surface of the penis, and often so close to the body as scarcely to enter the vagina in the act of copulation, and yet fecundation follows the act.

The recent decision of microscopists, already quoted from Kolliker, stating that the spermatozoa is not an animalcule, will set this theory at rest.

We must, therefore, account for the arrival of the "spermatic filament" in the uterus in some other way—by its specific gravity, the fluids of the vagina flowing back towards the uterus, while the female is in the recumbent position, during and succeeding the act—that this may be worthily considered in this connection is the popular theory, that procreation cannot be effected in a standing position, and that violent dancing immediately after sexual intercourse, will prevent pregnancy—by the semen being carried far up into the vagina by the mechanical action during the season of intercourse, a not improbable manner; or by some other method by which the vital principle of the semen is transmitted to the ovaries,

This latter view demands a particular attention. A physician, Dr. Brundige of this city, of decided anatomical ability, states that he has discovered two passages leading from the vagina direct to the ovaries. This demonstration I have never seen, but it is thus verbally described to me.

From near the external orifice of the vagina, upon the superior verge of the vulva, and upon either side, there may be often found a follicle sufficiently noticeable. It is of small size, and by inserting a probe, a pervious canal may be traced running posteriorly and

laterally along the broad ligaments, until it reaches the ovary. It is not always to be found in the human female, and sometimes but one only can be discerned, communicating with but one ovary. He states that in other mammalia, these passages are found with more constancy.

I am inclined to think, however, that the discovery claimed by Dr. Brundige was only the re-statement of an exploded view, made some time since by a Swedish anatomist, where the supposed conduit, never afterward satisfactorily demonstrated to exist, is but the remains of the Wolfian bodies. Still there is some authority for this statement, for M. Baudelocque stated (*Acad. Royale de Med.*, 12*th February*, 1826) that he had discovered a canal which proceeds from the right Fallopian tube, passes into the parietes of the uterus, and opens into the cavity of the cervix.

Its only occasional presence in the human female, as alleged, would seem to indicate that it was merely a correspondence of nature, and not in woman, generally of any practical importance. Still it would seem that perhaps, in a few cases, such a passage might exist, through which the vital principle of the seminal fluid might pass, and through which it did pass in the few cases of pregnancy occurring where an imperforate hymen, or any important malformation, or deficiency of the male organ existed.

By whatever route the fecundating principle takes,

it ultimately arrives at the ovary. Without much doubt, it is through the canal of the cervix, the uterus, and the Fallopian tubes. The only argument against this proposition is a theoretical one. It is stated, that nature, in no other instance, has created a canal or passage which serves two opposite purposes, *i.e.*, which serves at the same time both as an outlet and an inlet; that, therefore, if the Fallopian tube allows the fecundated ovum to come down in its passage to be deposited in the uterus, the spermatozoon must find some other way up. As neither argument, corroborating, nor contradictory hypothesis can settle this matter, and as it is not important to my plan, I shall leave the question with the mere statement of the two sides of the subject.

How the fecundation is effected is still as much a matter of doubt as ever. The astronomer in vain enlarges his telescopes, the instrument of double power but divides the supposed single star, leaving each as undetermined as the original—and the laborious embryologist in vain traces the spermatozoon in its path, and even when the microscope reveals him at his final entrance into the ovum—how the new creation is effected, is still a mystery above the ken of ordinary mortals.

All that is necessary to effect the renewed fertilization of the germ vesicle of an animal, is the bringing of a fertilizing vesicle into contact with the membrane of the ovum in which it is contained. An interming-

ling of the contents of the two vesicles then takes place, osmometric transudation occurring through the intervening membranes. Most physiologists now believe that the contents of both vesicles play their own parts in the production of the germ that is to develop a new creature, and that it is on this account the offspring ultimately presents some of the characteristics of each parent. Wagner conceives that the germ vesicle bursts and mingles itself with the albuminous and oily matters that surround it in the ovum, and that the contents of the fertilizing vesicle then pass into the ovum too, the entire ovum becoming the fertile germ vesicle. Dr. Martin Barry believes that fertilization never takes place unless the fertilizing vesicles pass *bodily* through the membranes of the ovisac, and get amidst the oily and albuminous matter within, as stated more fully in the following paragraph. Mr. Newport stated that this was by no means necessary, and that the mere contact of the fertilizing vesicle with the outer covering of the ovum for four or five seconds is sufficient to ensure the fertilization of the germ vesicle, although a merely instantaneous contact is not sufficient for the purpose.

Drs. Barry and Nelson have since re-affirmed, and published their observations of the entrance of the spermatozoon into the ovulum; but their statements were not regarded as completely satisfactory, but supposed to be disproved by Newport, till Keber, following the path which they had pointed out, and examining

the fresh water muscle, unio, in which this portion of conception is peculiarly evident, made out and described the different stages of this wonderful function. Bischoff, who at first denied most strenuously, now fully corroborates this statement.

"In the fresh water muscle (*unio*), at the time of conception, the ovulum, although still small, projects at one part a minute process which springs from the membrane of the abdomen, and perforates the cortical membrane. This process dehisces, lets escape a little albumen, and admits one of the spermatozoa which surround it. This done, the mycropyle, as it is called, again closes by constriction or obliteration.

"Afterwards (and sometimes earlier), there is formed near the mycropyle an adhesion between the membranes of the albumen and of the yelk, then the yelk-bag dehisces, receives the spermatozoon into its interior, and again is closed.

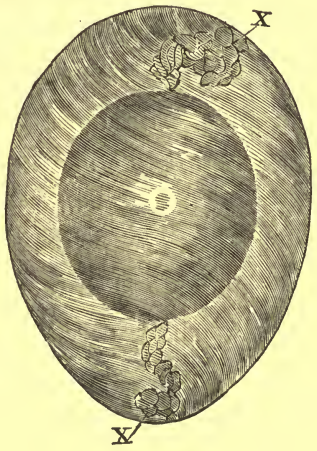
"The spermatozoon afterwards sinks deep into the yelk, swells, and becomes rounded; after some time a nucleus appears in it, while its outer membrane thins, and at length disappears.

"The nucleus of the spermatozoon splits up into several irregular divisions, which at first lie near one another, and then become diffused through the yelk, so that before the dissolution of the germinal vesicle, the yelk is filled with small particles from the male."—*Ed. Med. & Surg. Jour.*

Da Costa has doubted the correctness of this assertion of Keber, but the recent endorsement by Bischoff would seem to settle the matter.

The passage of the ovum after its escape from the ovary, is a matter of some interest. In the fowl we have seen it in *Fig.* 6 and 7. It falls from the ovary into a tube with a funnel-shaped end, through which it rolls along, with a slight twisting movement, enveloping itself in a quantity of viscid liquid albumen, secreted by the tube as represented by the *Fig.* 16, where we

FIG. 16.



see the ovum enclosed in albumen slightly coagulated, to show the spiral way in which the mass is arranged in consequence of the twisting of the ovum. At the further end of the tube, the secretion changes, and a

deposit of membrane and lime is made over the albumen, and we have the shell, the membrane, the white of the egg, the yelk, and the true germ vesicle floating within. The ovum is kept in its central place within the investing albumen, by the instrumentality of a couple of twisted ropes of albumen, one at either end—X X in the figure.

The egg of the fowl is many hundred times larger than the egg of any mammalia, and it is for this reason that the former is soon separated from the parent, while the latter is longer cherished; the germ vesicle of the former is to be nourished by the yelk, and its albuminous subordinate, but that of the latter is supplied direct from the parental blood.

The human egg in a similar manner falls from the ovary into the Fallopian tube, and arrives in the cavity of the uterus. The nutritious matter surrounding it, is sufficient but for a few days. We have already shown how the cells in the yolk may divide and subdivide, *Fig.* 11, and finally where the ovum throws out little rootlets from the chorion interlacing with the maternal portion, and from thence drawing its nutriment as in *Fig.* 11, *f.*

The further tracing the growth of the human egg, as it is more and more fully developed, is unimportant for the purposes of this treatise, and I leave it here unfinished. Curious and miraculous indeed is its wondrous growth. Within three or four weeks of the first

division of the germ vesicle, the foundations of the eyes, limbs, and the spinal cord are laid. In two more weeks traces of forming bone are observed, a face is sketched out, and fingers may be traced. In another two, a forehead, lungs, and ribs have been added. In another month a rudimentary brain, and a two-sided heart. In two months additional the nails and teeth bud, and in four beyond this, every organ in the scheme that is necessary for the accomplishment of human life. Then this growth of development ceases; thenceforward all growth is that of augmentation.

II.

PATHOLOGY OF STERILITY.

From what has already been said in the previous chapter, after copulation, fecundation is ensured upon certain conditions.

First, on the part of the male—that the semen be emitted *in loco;* that it contain the vital principle; that it be unmingled with syphilitic taint, or other morbific poisons.

It will be seen that this modern view entirely discountenances the speculations of Spallanzani in behalf of the sympathetic theory.

These circumstances may not occur, as before alluded to, first, from the abnormal size of the male organ, either from its diminutiveness rendering it insufficient, or from its excessive magnitude, preventing its entrance. Albinus has recorded a case of divorce granted by the Dutch courts, *propter magnitudinem ipsius penis.* A suit for divorce was commenced within a few years in this city, quashed by the death of the female before trial came on, where divorce was sought for upon this ground; the evidence being that the virile member of

the husband was eleven inches in length in its unexcite condition. Also, from its unnatural direction, or malformation of the frænum, from stricture of the urethra, which may retain the semen from flowing out; hypospadias, or a fistulous opening into the urethra may allow the semen to escape externally; an elongated prepuce tightly closed over the gland may act as a purse or bag, retaining the semen within its cavity, to be discharged only after the organ is withdrawn from the vagina, and the erect condition passing off, allows it to flow forth freely.

Secondly, the spermatic fluid may be devoid of spermatozoa; from disease of the testis; from the effect of poisonous drugs; from mercurialization; from mere old age. *

Thirdly, constitutional syphilis, acute blennorrhagic discharge, or chronic gleet may destroy, by its admixture, the vitality of the seminal emission.

The consideration of the deficiencies of the male parent belongs to a treatise on impotence, or the disorders of the male genital apparatus, and they are here but briefly alluded to *en passant*.

Secondly, on the part of the female, the semen of

* Rare examples are on record of virility in men of very advanced age; thus, Massinassa, king of Numidia, begat Methynate after 86 years. Wadilas, king of Poland, had two children at 90, and Thomas Parr possessed all his powers, as is well known, at 100 years. I knew a child of the Hon. Jeremiah Smith of New Hampshire, begotten at considerably over 80, who possessed the form and features of the Judge in a marked degree.

the male may fail to enter into the vagina, or the uterus, or its vital principle to come in contact with the ovum, which is consequently left unfecundated ; its vitality may be destroyed by acrid, vitiated, syphilitic, blennorrhagic, or cancerous discharges ; or it may, without any change, be washed away by the immense flow of the leucorrhœal exhalations.

The semen of the male may fail to enter into the vagina, or the uterus, or its vital principle to come into contact with the ovum.

It may fail to enter into the vagina, from malformation of the vagina itself. It is proper to allude in this connection to the rare cases of adhesion of the labia from inflammation,* and to the still more uncommon cases where no vagina existed, as in the case reported by Fodéré, as occurring in 1722, and again another, by Amussat, to the French Institute in 1835.

Not an uncommon form of this difficulty arises from an unusual growth of the hymen, closing up entirely all

* The most common cause of this abnormal condition is its intentional production by the surgeon to alleviate worse evils. Thus my esteemed friend, Dr. H. Weeks Brown of this city, during the last year, united the labia-majora, the only operation possible, to relieve the dire effects of a complete prolapsus uteri. This serious and bold operation was entirely successful. Within a few months, I assisted my friend, Dr. Sims, in his operation — *the* operation of this century—for vesico vaginal fistula. The base of the bladder was entirely destroyed, and the only possible operation was to destroy the vagina. This unique and hazardous, yet successful operation, was effected by passing sutures of silver wire, fastened by clamps, from the rectum posteriorly, through the labia majora anteriorly.

entrance to the vagina. "This organ assumes a great variety of appearances; it may be a membranous fringe, with a round opening in the centre, or a semi-lunar fold, leaving an opening in front; or a transverse septum, leaving an opening both in front and behind; or a vertical band, with an opening at either side." Tolberg, in his Medical Jurisprudence, I think, enumerates thirty different varieties.

When this organ is imperforate, the menstrual fluids are not apparent, and are, when secreted, retained within the vagina, and the uterine cavity—the uterus gradually expanding to receive the monthly accession—until the protuberance of the abdomen and other symptoms plainly evince the retained fluids.

The quantity thus retained is sometimes immense. In a case operated upon at the London Hospital it amounted to two gallons. Cases of death are on record from the filling up of the Fallopian tubes after the uterus is overflowed, and its escape into the cavity through the fimbriated extremity, produces peritonitis.

More frequently the orifice is small, and sufficient to allow, sometimes with accompanying pain, the discharge of the menses.

In rare instances, the hymen, which is usually a thin and easily dilated, or lacerated membrane, proving but a feeble barrier to sexual congress, is made of sterner stuff, and resists all the force which can be brought against it by the male organ, or the finger of the examiner.

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A lady who recently came under my notice, had been married some ten years, and with whom, for this reason only, sexual intercourse had never been consummated, false modesty being overcome, she applied to her physician, who consulted me in respect to the case, when, after appropriate means were used, congress was not only facile, but I believe fruitful in its results.

Another form of mechanical impediment arises from the contractions of the vagina. These may be the effect of disease, or the cicatrices of wounds. I might say that it was possibly sometimes congenital, but that I think it scarcely probable, and rather that this condition is the result of inflammation, which at an early age not unfrequently occurs in poor and ill-cared for, neglected children of every class.

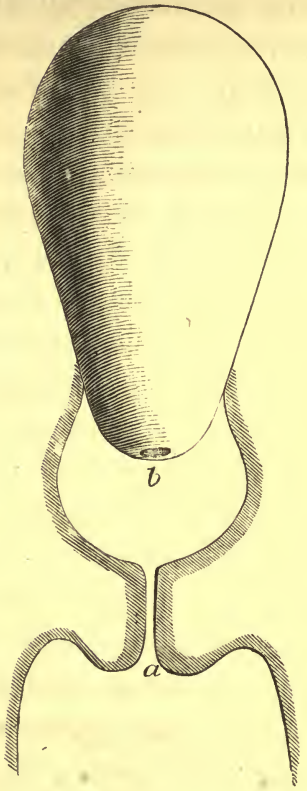
Dirt, primary and inherited constitutional syphilis, not only frequently are followed by adhesive inflammation and contraction of the vagina, but gonorrhœa, leucorrhœa, and others of the profluvia, by their acrid nature, inflame and irritate these textures, and the resulting scar of the acute inflammatory affection is the cicatrized or contracted vagina.

External wounds from injuries, falls upon sharp stones, fences, tools, or other objects, have, during the recuperative process, resulting in the cure of the wound, so contracted the vagina as to entirely preclude the entrance of the male organ.

Instances of which I have known, have arisen from a fall upon any sharp instrument. Several are recorded

in various medical journals, where the patient was impaled by falling upon the upright handle of a pitchfork, &c. (*Am. Jour. of Med. Sciences*), Oct. 1853, pp. 355–399.

Fig. 17.



In Fig. 17, we have a representation from Prof. Meigs, of an unusual form of stricture of the vagina, which

was the cause of an almost fatal error in diagnosis. Similar strictures are occasionally seen, which it is necessary to remember and to recognize. In the case above displayed, the stricture in the vagina *a*, was supposed to be the open os uteri, which, as may be noted, *b*, is an inch or two higher.

Wounds during previous tardy labors have often resulted in sloughing, general disorganization, contractions, and cicatrizations. Dr. Joel Foster consulted me in the case of a lady where such a result occurred, the inflammation being so extensive and so intense as to be followed by entire union of the sides of the vagina, and a perfect obliteration of the cavity of the vagina.

Sometimes, from malposition of the uterus itself, as in falling of the womb. This complaint is very generally but a symptom of uterine congestion, hypertrophy of the os uteri, &c., but occasionally it is simply a falling of the womb. Where this condition exists to any great extent, pregnancy is rarely found. The irritation causes so great a leucorrhœal flow as entirely to carry away any semen deposited. Still I have seen a case of falling of the womb so complete that the vagina was completely everted and the os uteri was exposed to view, yet the woman was impregnated, *la verge de l'homme étant introduite dans l'os utéri même.* — (Reported in *Am. Jour. of Med. Sciences*, Oct., 1846.)

Chopart reports a similar case, and Dr. Gruhn of Reppen, a like case of prolapsus, which accident how-

PLATE III.

Fig 1

Fig 2

T. Sinclair's Chromo lith. Phil.ª

ever did not occur till the fourth month of pregnancy. The vagina is also contracted in its length, being a mere fent or chink between the labia—in its circumference —amounting almost to obliteration. In one instance recorded, this contraction was such as to simulate the os uteri, and the attending physician, examining per vaginam, supposed that he had arrived at the external os uteri low down in the pelvis, and the case was supposed to be a falling of the womb.

I need not add that the presence of tumors or other adventitious growths in the vagina, the rectum, the bladder, or in the adjacent cellular substance, may so block up the passage as to render it impossible, or nearly so, for the semen to fairly enter into the vagina. In one case, where there was chronic constipation of the bowels, the rectum was so completely filled, as to materially diminish the calibre of the vagina, so that with the extra sensitiveness of the parts, full coition was not effected, if possible.

The semen of the male may fail to enter into the uterus. In a few rare cases recorded, the vagina, from congenital malformation, has opened into the rectum, and sometimes it ends in a *cul-de-sac*, leaving the uterus to open either into the cavity of the bladder or the rectum. Dr. Steger, (*Nashville Journal of Medicine and Surgery, August*, 1855), records a curious malformation, where there " was no development whatever

of the labia externa observable, nor even the slightest trace, or indication by which we should infer that they ever existed; about two inches above the symphisis pubis, on the linea alba, there is an opening from the uterus not more than an inch and a quarter in length, presenting rather the appearance of a smooth incision, than the misplaced pudendum, and immediately above which there is a hirsute growth and a merely observable development of a mons veneris. From the external opening of this orifice to the os tincæ, about two and a half or three inches, is the vagina covered by a smooth surface of mucous membrane, the urethra perforating it immediately under the deep-seated fascia." This woman, a negro slave, was however, pregnant, and delivered by a sort of cesarian operation, which was the enlarging this peculiarly situated vagina, by a longitudinal incision.

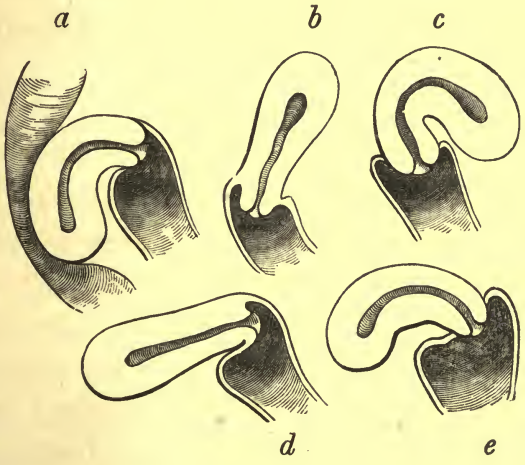
But having surmounted the obstacles in the vagina, peculiar difficulties sometimes occur impeding fecundation from disorganizations in the womb itself—in the os externum, the cavity of the cervix, the os internum, in the cavity of the body of the womb, in the Fallopian tubes, in its fimbriated extremity, in the ovary.

In investigating these various difficulties, I shall have occasion but to merely enumerate the occasional congenital absence of the uterus itself, or the os and cervix only, leaving the body remaining healthy (such doubtful

cases having been reported), or the general diseases of its various tissues, or its appendages, where those diseases do not affect the interior portion with which the seed of the man comes in contact, in its passage to unite with the ovum. Such, for instance, are numerous forms of tumor, and of local or other manifestations of constitutional syphilis, which according to its location, may or not form a barrier to fecundation. Their general effect, as disturbing the constitution, will be referred to in a distinct paragraph.

The semen may fail to enter the cavity of the womb from an imperforate os uteri, or the alteration in the passage, or its closure, by the doubling of the womb

Fig. 18.



upon itself, as in the forms of disease, or rather of debility, of late recognized as much more frequent than

was generally supposed, variously called (by refinement of nomenclature more exact than the appearances they are supposed to represent,) retro and ante-flexion or version.

In Fig. 18 we have representations of various obliquities of the uterus ; *a*, *c*, and *e*, are of the class called flexions, while *b*, and *d*, are denominated versions. As may be supposed, there are endless varieties and shades of deviation from both of these classes, and I have therefore used these terms synonymously.

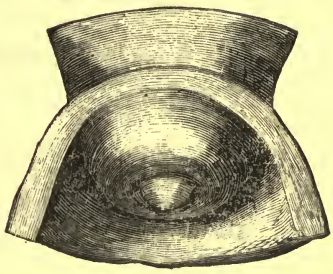
By reference to Plates II. and III., the position of the uterus will be perceived in situ, and in reference to the other organs, Plate II. representing the womb in the normal position, and Plate IV., indicating it in a position, resembling *d* in Fig. 18.

This obliquity, it will be perceived, not only affects the functions of the uterus, but it also seriously militates with the healthy action of the rectum and bladder, as it presses upon one or the other.

By this accident the womb is forced into an abnormal condition, as if doubled together, and it may readily be perceived, that the interior canal must not only be sensibly diminished in its calibre, but the opening of the os must be more or less drawn aside and occluded. In these cases the menstrual fluid being secreted within, is discharged with more or less pain, often with very great accompanying suffering, by means of the muscular uterine force. No such force is exerted, or can be, to

force *in* the seminal fluid, which consequently rarely reaches within the uterus. I am convinced that this obliquity is the present cause not only of sterility, but also of dysmenorrhœa in very many cases, from the number of such instances which have within a short time fallen under my observation, both in private practice and public charities: and I am equally persuaded that I have passed by unnoticed, many other similar cases, because my attention had not then been directed to them.

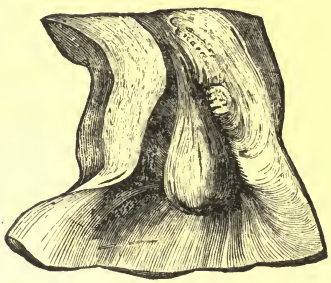
Fig. 19.



Another form of mechanical obstruction is the presence of tumors, filling up the orifice or some portion of the passage. They are of various characters, and those of the fibrous nature, often growing to an immense size—the largest pedunculated on record, as reported by Dr. J. W. Francis, weighed one hundred and one pounds. Polypi, either vesicular, mucous, or cellular, in various localities affect this end. They are very

often not suspected, for the menstrual flow is, perhaps, more than ordinarily free, certainly as much and as frequent as usual. The polypus hangs by a pedicle from the os, from within the neck, within the cavity of

Fig. 20.



the uterus ; projecting into the passage more or less, and acting as a valve, preventing all ingress, but not interfering with egress. (*Plate III, & Figs.* 19, 20, 21 *&* 22.) The vesicular polypi are often most insignificant in appearance, not larger, frequently, than a half-pea, (*Plate III, Fig.* 1.) often unnoticed by the patient, even passed over by quite shrewd medical men, whose attention has not been directed to them—unfelt by the touch, and unobserved by the speculum.

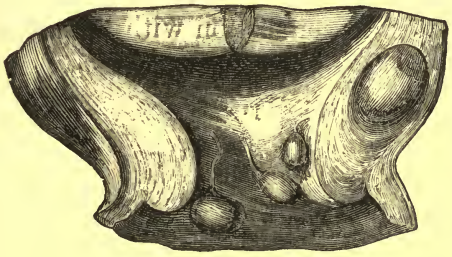
Often, however, they are not perceptible by any sense, until the os externum being dilated with an instrument, discloses the little parasite concealed within the cavity, a sure sentinel, permitting not even the proper occupants of the locality to enter and pass in.

Blood constantly exudes from these tumors for many

months, until the patient's strength is quite exhausted by this slow and continuous hemorrhage. Their vascularity may be seen by reference to the figures on Plate No. III, taken from Professor Meigs' excellent *Essay on the Acute and Chronic Diseases of the Neck of the Uterus, in the Transactions of the National Medical Association*, Vol. vi.

Other tumors may exist within the substance of the os uteri, which may so press upon the canal as to close it against any entrance.

Fig. 21.

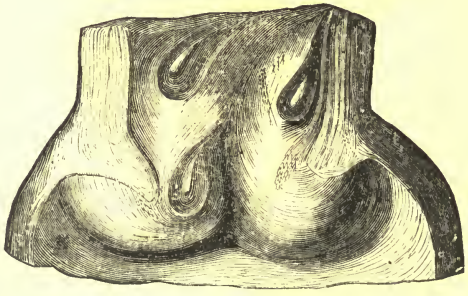


Some six months since, I saw a lady about twenty-six years of age, a patient of Dr. Cyrus Weeks, who had never menstruated, although every four weeks she was compelled by excessive pains in the back and abdomen, to keep her bed for several days. She had been married about two years, but without experiencing any change, neither had she been impregnated. On examination, the finger discovered nothing abnormal, and when

passed into the rectum, the uterus appeared to be about three times its natural size. The uterine sound could not be passed through the internal os uteri. It was concluded that a fibrous tumor filled the interior of the uterus, which originated in the substance of the uterus and entirely occluded the passage.

The presence of hydatids can scarcely be called a cause of sterility, since, in the opinion of the ablest pathologists, as Desormeaux, Velpeau, Orfila, Milne Edwards, Pouchet, Meigs, and others, hydatids are commonly nothing more than a pathological degeneration of the product of conception. Still their presence actually preventing subsequent impregnation, I have mentioned them in connection with the other causes of sterility.

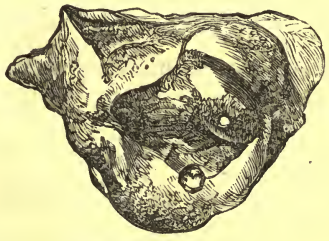
Fig. 22.



One form of disease which may sometimes be considered as polypi, especially as polypi of the diminutive character above referred to, are the *ovula nabothi* —a name originating from the early supposition that

they were abortive ovules which had attached themselves to the os and cervix uteri. Subsequent writers have spoken of them as obstructed follicles of the mucous membrane. Dr. Whitehead considers them to be glandular bodies, and states that he has "strong reasons for believing that their function is intimately, if not solely concerned in the phenomenon of the venereal orgasm." He also says, "I have been led to regard the nabothean bodies as consisting anatomically of an erectile tissue, inclosing a number of cells and tubes, which probably have a peculiar arrangement, and are highly organized. After the escape of their contents, the accumulation and emission of which appear to be but a momentary act, they immediately collapse and

Fig. 23.



disappear from view." Dr. Tyler Smith, satisfactorily disapproves this opinion, alleging that the difficulty of finding them in the healthy state, is one of the best proofs of their non-existence, except as a diseased condition. He considers them the origin of the vesicular polypi above noted. They are in themselves little cysts,

rarely seen except in diseased states of the os and cervix uteri. They may be noted in Fig. 23, where the os and cervix uteri, partially inverted, show the cervical rugæ. Two nabothean ovules are visible, and the surface of the os is eroded in patches.

For full dissertations on the pathology of these tumors, see Huguier's *Mémoire sur les Kystes Folliculaires du Vagin*; M. Robin's *Mémoire pour servir à l'Histoire Anatomique et Pathologique de la membrane muqueux Uterine, de son Mucus, de la caduque et des œufs ou mieux glands de Naboth*, or the able *résumé*, by Tyler Smith, from whose work on Leucorrhœa, I have borrowed Fig. 23.

By far the commonest cause of Sterility, as it has appeared to me, is from disease of the os externum, and particularly that form mentioned by Bennett, and deduced from the teaching of Recamier, Lisfranc, and other French magnates of modern days.

The treatment of all diseases of females, has been immensely simplified by the discovery of the speculum by Recamier, and both French and English have written much upon its value and the results gathered from its use. Still they have not laid stress upon its peculiar value, as an adjuvant for the cure of sterility.

Most barren women believe themselves in perfect health; at least very many of them do not dream of any local disease, which is the cause of this condition. They are content with the idea of personal idiosyncrasy.

In a large proportion of these females, a speculum examination evinces a greater or less degree of chronic inflammatory disease of the os and cervix uteri, and, the cause and continued persistence of it is easily accounted for in many instances.

The trouble commences sometimes before marriage, sometimes during the "honey-moon," sometimes, and very often succeeding an abortion, or after a "bad getting up" at childbirth.

The cause of the various forms of uterine disease is certainly not entirely known, but my own investigations have shown some facts not generally recognized.

First.—There are often originally internal manifestations corresponding to external cutaneous affections. Were not these facts demonstrated, we might reasonably infer their existence from the marked similarity which exists between the mucous membrane of this locality and the skin; this resemblance being much more evident than between the mucous membranes of other situations, and the cutaneous structure. The facility with which, in cases of prolapsus, the exposed mucous membrane of the everted vagina takes the character and functions of the skin is another corroborating proof.

Secondly.—There are forms of disease accidentally excited, developed and modified by the locality, of general constitutional taint.

First.—Every medical man knows that small-pox and varioloid not only form their pustules on the

external skin, but also on the internal mucous membranes, and that they and their subsequent cicatrices are noted on the eye-ball, the tongue, the fauces, tonsils &c., and even on the internal viscera. So also they may be observed upon the os uteri. Rubeola is noticed on the throat and vagina. Scarletina exfoliates the epidermis, but the mucous membranes of the throat, ear, eye, vulva, uterus, secrete pus. Psoriasis exzema, and lichen, have corresponding types upon the vagina and cervix uteri. Hence have originated as I have noted, many of the uterine difficulties. This view I need not develope further, its probability will render it scarcely questionable, and observation will endorse the bill of credit.

Secondly. — Local scrofulous disease is often observed in the same manner that we recognize local cancerous developments. A tuberculous diathesis is manifested not only by tubercular lungs, tubercles in the brain, kidneys, but also, less recognizable as the same disease, by tubercles in the bones. Still more remotely of the same type, by long eye-lashes; extreme purity of skin ; peculiar growth of the nails ; a tendency to slow glandular inflammation, an ! subsequent suppuration ; and likewise, according to my own observations, by a tendency to uterine excitability, and consequently of disease,

That tuberculosis or a phthisical disposition is manifested in uterine excitability, it is useless to reason upon, but the marked tendency to fecundation evinced by

the consumptive woman is universally conceded. The prolific disposition of those of a cachetic family, although as yet manifesting no form of this disease, needs only to be looked for to be plainly perceived.

Be it when it may, with very rare exceptions, this condition of things is *never* corrected, and the disease *never* disappears, unless by proper treatment, or by the effect of some overwhelming disease, diverting the powers of nature, until after the cessation of the menses, when every hope of offspring has ceased.

The speculum plainly discovers the lesions, or the educated touch—educated by the conjoined use of the speculum—may often distinguish the local difficulties.

Scarcely twenty years has attention been paid to these local diseases, and it is only the younger men of the profession, taught to observe these manifestations, of disease, that fully understand and recognize them: The knowledge of first principles, can, as a general thing, be properly and easily attained but in comparative youth. The old physician is slow to adopt new ideas, and even were his mind ready to entertain them, the senses unpracticed when in the vigor of youth are dull for the required perception. The elderly man can never bring his ear to detect the nice distinctions of sound in pulmonic and cardiac complaints, or the evidences of foetal and placental circulation in pregnant women. The ear of the old physician can never be but imperfectly educated.

The eye is the same, and the sense of touch is equally imperfect. With the speculum, the aged vision may indeed behold immense disorganizations, and large fungous growths; the feeble finger may discover a gaping os, or the ravages of cancer, but to the true eye, and the *tactus eruditus* of younger years, what appear but trifles to the former, or remain unnoticed until pointed out, are easily discernible.

It is these "trifles" not unfrequently, I may say almost invariably, in apparently healthy females, in which consists the disease of sterility.

The os and cervix uteri, in one or all of its surfaces, exterior and interior, is the seat of inflammatory diseases, both acute and chronic. It is the latter form that immediately interests us.

The symptoms of the disease are dragging pains in the back, in the loins, in the thighs, a sinking feeling in the stomach, irregularity of the bowels and of the menses, sympathetic irritation of the stomach, frequent micturition, loss of appetite, sometimes vomiting, occasionally morning sickness simulating pregnancy, headaches, great nervous susceptibility, fainting, spasms, great fatigue upon slight exertion. These symptoms in numerous degrees, and variously modified in different cases, are accompanied very generally by a more or less profuse vaginal discharge, known as leucorrhœa, whites, "a weakness," &c.

Leucorrhœa has been always considered to be a

disease of doubtful pathology, but I apprehend that before a very long time, in a work on Diseases of Females, that name will be recognized only as the name of a symptom of numerous fully recognized disorders. Some advance towards this result is already attained, and it still retains its place as the designation of an affection, solely because the advance of science has not yet recognized in one or two classes of cases only, the particular lesion upon which this flow is dependent.

In some forms of these complaints, although occasionally of considerable apparent magnitude, no discharge is perceptible. Sometimes there is no discharge worthy of note. Occasionally the speculum evinces that this exhalation is very considerable, but as it does not escape from the vulva, we can account for its disappearance in the lower portions of the vagina, only by its being absorbed in its progress outward.

The character of this discharge is pathognomonic, of the locality from whence it springs. Dr. Tyler Smith, of London, in his memoir before the Royal Medical and Chirurgical Society, April 1852, and subsequently gathered into a volume under the title of "*The Pathology and Treatment of Leucorrhœa*," and Dr. Brigel, of La Charité, Berlin, have made full microscopic and chemical investigations of this secretion, and have thrown much light upon this subject.

According to the latter, the secretion of the uterus is always alkaline, that of the vagina and urethra, acid,

and that of Duverney's glands neutral. If the secretion is found sometimes acid, and sometimes alkaline, this depends upon whether the uterus or the vagina furnishes the largest share. The discharge is, however, almost always sour, as the acid reaction of the vaginal secretion is too considerable to be neutralized by the alkaline fluid, &c. 2, great viscidity (*Zähigkeit*), of the secretion indicates that it is uterine. 3, milk-white secretion, that is not viscid or filiform, denotes simple vaginal catarrh. 4, a puriform condition results from acute or chronic gonorrhœa, but may also depend upon other conditions. In the first case, the urethra, and Duverney's glands are especially affected, but not so in the others. 5, the microscope enables us to distinguish whether the discharge proceeds especially from the uterus or the vagina, and also whether it consists merely in an increased separation of epithelial cells (simple catarrh), or is accompanied by the formation of pus cells (blenorrhœa.) 6, the author has carefully sought for, without ever finding the trichonas vaginalis, which Donné states to be characteristic of infecting fluor albus ; but the changed epithelial cells, enclosed in tough mucus, bear a great resemblance to the figures he has given.

Mons. Donné found that in the healthy secretions of the vagina and uterine canal the spermatozoa lives for a considerable period, but that in certain morbid conditions they are speedily destroyed. Dr. Tyler Smith has elicited many important facts, and his

chemical examinations of the secretions from the various portions of the utero-vaginal canal, have plainly shown that excessive acidity of the vaginal mucus, or increased alkalinity of the cervical mucus, are alike destructive to the spermatozoa. Dr. Whitehead also notes the same general facts.

The great point pertinent to this investigation, is, if this discharge be or not albuminous. If albuminous, or even partially so, then it may be set down as positive, independent of further observation, that the lesion is within the os externum uteri; for the glands of the vagina do none of them secrete albumen; they are muciparous glands, and their exhalations are mucus, or if diseased, mucus combined with pus.

On the contrary, the intra cervical glandular apparatus secretes albumen, with or without pus combined, according to their health or diseased condition.

Finding a profuse discharge combined with albumen, or great general diseased action without external discharge, duty must overcome delicacy, and a physical examination is imperative, and he who neglects this, neglects his duty, disregards the obligations which he voluntarily assumed on entering the profession, to do all in his power to assuage the ills incident to humanity. Ignorance is no excuse in the eyes of the law, on the part of the physician it is unpardonable.

The finger passes into the vagina, and reaching the os

uteri, may find it in various localities and conditions—low down and anterior, high up and posterior, indicating either the ante or retro-flexions before referred to, or prolapsed by its own weight, and the lax condition of the vaginal walls resulting from its diseased condition. In size it will vary from a slight enlargement to an immense hypertrophy, being not unfrequently many times its original size and weight. It is this increased ponderosity that gives it the phase of "falling of the womb," till recently the only recognized symptom. In the vast majority of cases, "falling of the womb" depends wholly and only upon this increased weight, and this increase is owing merely to causes which we shall proceed to enumerate. One affection so induces another, which itself excites a third, and this reacting upon the first, and so through the chain, that it has been difficult to determine the great first cause. Patient investigation however, has. at last found the root of the matter, and the finger of the explorer arrives at it, when, upon the surface of the hypertrophied os uteri, he feels a soft, unctuous, velvety spot. This is generally felt at and around the os externum, occasionally limited in extent, generally confined to the anterior or posterior lip, but in severe cases embracing and entirely covering the os and cervix uteri.

When limited in extent, the portions of the os surrounding this described spot, are often hardened in their character, giving a firm, unyielding impression to

the touch, and the edges, the point of union between the healthy and diseased surfaces, seem in some cases thickened and defined.

The os externum is found, not as in the healthy state, with difficulty admitting an intra-uterine sound, but the finger passes into the cavity to some distance, and often seems capable of being introduced up to the fundus of

Fig. 24.

the uterus itself. The character of the walls of the neck of the uterus seem materially changed; they are

flaccid and easily dilatable, so that with ease a second finger may often be introduced by the side of the former.

Upon withdrawing the finger, it will be found covered with a muco-purulent discharge, often mixed with freshly exuded blood.

To the touch nothing more is capable of being elicited, but the speculum throws a flood of light upon the matter. By its use we perceive that what was to the finger soft, velvety, is an ulceration, and the unctuous softness comes from the granulations of newly forming substance, or the denuded papillæ. We find that invariably this ulceration starts from the cavity of the os, or at any rate that the os internum is always involved in the ulcerated portion.

From the exterior of this ulcerated surface proceeds the pus, the yellow ingredient of the leucorrhœal discharge; while flowing from the os, a limpid, tenacious fluid, may be observed adhering with so great tenacity that it cannot be wiped away.

The ulcer bleeds, often from the mere touch of the instrument, or the soft sponge or lint used to wipe away the secretions.

In color the ulceration varies, according to the character and intensity of the inflammatory action going on, and the condition of the surface. A peculiar form is the "raspberry os" (see Plates I. and V.), so called from its general resemblance to that berry, and

which in its surface is nodulated from the exaggeration of the villi, till recently supposed to be mucous follicles, like the inflamed papillæ of the tongue in glossitis, or particularly in scarletina.

Fig. 25.

I have called this morbid lesion an ulceration, notwithstanding that Lee and some others deny that it is such. They state that there is no lesion except of epithelium, and that abrasion would be a better term to apply to it. According to the teachings of my youth, an ulcer is but "a solution of continuity attended with a secretion of pus;" and the condition of things answers

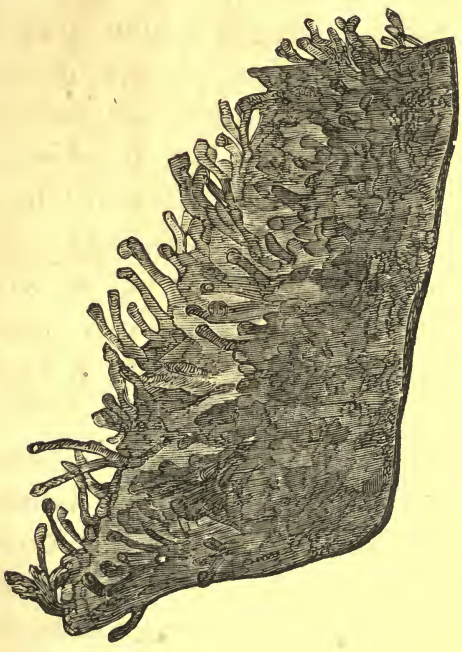
to this statement. In the heat of unworthy party and unprofessional controversy, the London physicians have left the main issue of facts, and have disputed merely about names. The condition of things is however, as I have stated, call it by such names as you will.

Fig. 26.

Fig. 24 is a circumscribed ulcer of the os uteri, magnified twenty diameters, showing the removal of the epithelium and erosion of the villi. The ulcer is surrounded by a fringe of enlarged villi. Figs. 25 and 26 represent respectively these villi, of the os uteri magnified two hundred and twenty diameters, and of the cervix uteri of one hundred diameters, covered with

epithelium. These, till recently, were considered to be the enlarged mucous follicles, on the authority of Huschke, who stated that these follicles which are numerous at the ostium vaginæ became more frequent as the mucous membrane approached the cervix uteri. Paul Dubois states that M. Giraldès, the able anatomist was unable to discover any in the upper part of the vagina.

Fig. 27.



On examination of these villi, which may often be seen with the naked eye, like the papillæ of the

tongue, they are found to consist each of a looped blood-vessel, which may be seen passing to the end of the villus and returning to its base (Figs. 25 and 26), where it inosculates with the neighboring villi. Seen in profile (Fig. 27), they evidently project above the surface, forming an irregular fringe upon the edge, and as a whole, are not unlike the "pile" of velvet.

From the anatomy of this morbid condition of the parts, we do not wonder at the readiness with which these surfaces bleed upon the slightest touch, or even from the friction caused by the gentlest exercise.

More particularly, it is to be noted that in that form of ulceration or epithelial abrasion already alluded to, as called the "raspberry os," *os framboisée*, sterility is its constant accompaniment, and this is the result of the observed fact that the disease seems to originate within the cavity of the os, and spreads outward upon the external surface of the os and cervix.

This is one of the most ordinary forms of uterine disease in females of leisure, those who have time to be sick, and in those of the laborious class, whose employment is of a sedentary character. It is therefore very common in private practice, and comparatively rarely seen in our cliniques, dispensaries, and other public institutions, and then principally confined to seamstresses and the like. I account for this from the fact that the poor washerwoman is obliged by her necessities, to be active, and this slight form of disease, neglected

in its origin, is, by the friction against the vaginal walls, increased, till a more serious form of difficulty ensues, which alone brings her to the public charities. While recently attending the obstetric clinique of my esteemed friend, the erudite Professor of Obstetrics in the New York Medical College, Dr. B. Fordyce Barker, I was happy to hear these views confirmed, and there first publicly stated. So important have I deemed them in connection with this subject, that I have thought it proper to enlarge upon this form of papillary hypertrophy, looking like morbid granulations, and to exemplify it more fully by the cuts borrowed from Tyler Smith's "*Pathology and Treatment of Leucorrhœa.*"

Were this the proper place, I would present my views supported by facts relative to the development of phthisis, superinduced or developed by the wasting effects of the discharges consequent upon this form of uterine trouble.

It is well known that females of a strumous habit are particularly subject to leucorrhœal discharges, and consequently to uterine disorganization. In my attendance at the Northern Dispensary, it has not unfrequently occurred that a patient was under the care of Dr. Cammann for cough and disease of the lungs, and at the same time I was topically treating the uterine

difficulty. Sir Charles Clarke noted that women in whom the glandular system is more active than usual, are affected with leucorrhœa. Dr. Tyler Smith says that leucorrhœa is common in consumptive patients, but not sterility. Dr. J. W. Francis has noted an hereditary tendency from constitutional debility. Mr. Anderson, in the Association Journal, places leucorrhœa as a symptom of phthisis.

A state of general anaemia probably, by interfering with the maturation of the ovules in the ovaria, is always unfavorable to fecundation, and when this condition advances to amenorrhœa, and chlorosis, the function of ovulation is always suspended. Fecundation is not incompatible with ulceration of the os externum. We often find immense hypertrophy of this portion covered with extensive ulcerations, bathed with pus, where conception has occurred time after time. Occasionally, too, pregnancy with such local condition will run its full course in safety, but, far more generally, abortion or premature delivery is the result. Particularly is abortion apt to ensue where there is accompanying *fissure of the os* (See Plate V., Fig. 1). This form of abortion, which is not, although pertinent, within the scope of this treatise, I have described in a paper, entitled "*Uterine Haemorrhage*," in the "*American Medical Monthly*," *June*, 1855.

But while fecundation is possible, although improbable, in the great number of instances where such ulcer-

ative disorganization exists, it is, I imagine, if not utterly impossible, at least nearly so, where there is this thick, glairy, albuminous discharge blocking up the os externum.

To this point I am anxious to draw especial attention, because it has been heretofore, generally, if not universally, overlooked by practitioners. The only recognizable morbid appearance in many cases of confirmed sterility, is this exudation from the os externum ; this thick, tenacious, firmly-adhering collection of albumen, which we cannot wipe away with a piece of lint, nor draw away with a forceps, unless coagulated and solidified by chemical change, effected in its character by local application. It would seem from its tenacity, impossible for the most vigorous spermatozoa, to pass through this substance, and as we shall show, equally difficult to pass between it and the internal surface of the os.

Dr. Tyler Smith, *op. cit.*, and Professor Meigs, in his "*Acute and Chronic Diseases of the Neck of the Uterus*," recognize this appearance ; but the former, without connecting with it its most invariable concomitant of barrenness, and the latter passing it by so casually as to deprive his observations and remarks of much of their proper force.

He says :—"But in cases where a thick and highly viscid string of mucus is constantly exuding from the os uteri, we can easily understand that the ascent of

the spermatic particles through the cervical neck may be impeded mechanically."

Bennett in his invaluable work, says:—"It is difficult to determine precisely, in what way inflammation and ulceration of the neck of the uterus occasion sterility, although careful and lengthened observation enables me to assert most confidently the fact. * * The cause of sterility may be removed by curing the inflammatory disease to which it owes its origin."

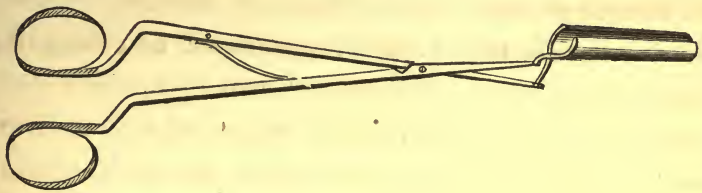
Besides the external visible ulcerations of the cervix, we often find instances where the os externum is of natural size and appearance, except a slightly increased redness, and accompanied by this plug of albumen; and in other cases, finding the os enlarged, admitting the finger to the first joint. In these latter, however, the disease is so great that it is easily recognizable, but the discharge so profuse, that the peculiar albuminous plug is rarely seen blocking up the passage.

Ocular examination of the cavity of the os uteri is easily made. In the cases where the local disease is great, without the further aid of any instrument, the gaping lips of the os will plainly show the inflammatory action within (See Plates I. and V.). In other cases it may be necessary to separate the lips, by lifting the upper border with the uterine sound, or more forcibly expanding the passage by means of the blades of long uterine forceps or the speculum of the os uteri.

A very ingenious instrument for this purpose is

made by Mr. Tiemann, the well-known surgical instrument maker, Chatham St., N. Y., which well answers this purpose, separating the lips of the os uteri, and effectually displaying its interior (Vide Fig. 28).

Fig. 28.



In most instances it will be found difficult to observe the internal disorganization, but without being seen, the presence of the albuminous plug will be pathognomic of the existing disease. In the forms where the vision can plainly observe the morbid action, one manifestation of disease is always recognizable, viz. the same inflammatory affection observed on the external surface of the os, modified only by the different structure affected.

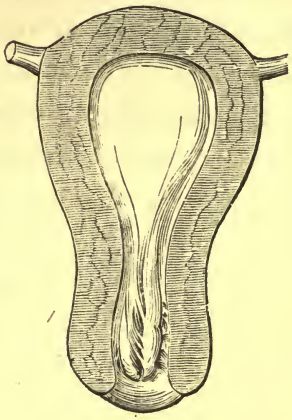
The true mucous membrane which begins at the cervix uteri and covers the os uteri in its vaginal portion is continued through the canal of the cervix, and is reflected over the internal surface of the womb; but below it, in the cervical canal, lie numerous albumen-secreting glands, whose office is apparent in the abundant exhalations attending labor. At the men-

strual period and at seasons of sexual intercourse, these glands are also active, and a profuse emission of fluid appears to take place. Under certain circumstances, from too frequent and inordinate sexual congress, as seen especially in prostitutes ; from the local injury of the parts, as often visible as the consequence of the too forcible entrance of the male organ with the new-married ; from the effect of prolonged and fatiguing exercise ; dancing ; of weighty dress ; of severe cold, arresting the secretions suddenly, at a menstrual period ; from prolonged irritation from the friction of the cervix against the rectum torpid and overloaded ; from a similar state of things caused by the retained contents of the bladder in extra delicate ladies, a more or less severe and extensive inflammatory action takes place, and the result not unfrequently observed as a *sequela*, is the chronic irritation, if you please so to denominate it, or inflammation of the local glandular apparatus, the glandulæ nabothii. Where the disease is slight, the increased discharge, its viscidity, its tenacity are the most manifest indications, as I have stated. They are not accompanied by any symptoms sufficient to draw the attention of the sufferer to the part. There may be no pain in the back, loins, thighs, no debility ; but there is enough disease to prevent conception, and simply from the mechanical cause before mentioned.

This is a general relaxation marked by the flaccid con-

dition of the uterus, a patulous "feel" to the os, the mouth being more or less enlarged, and the cavity of the canal open, resembling the appearance seen in Fig. 24. Contrasting this with Fig. 4, the abnormal condi-

Fig. 29.



tion is palpable. Such a condition of the os and cervix will be manifested by little general symptoms other than debility, albuminous leucorrhœa, and profuse menstrual discharges, and consequent sterility.

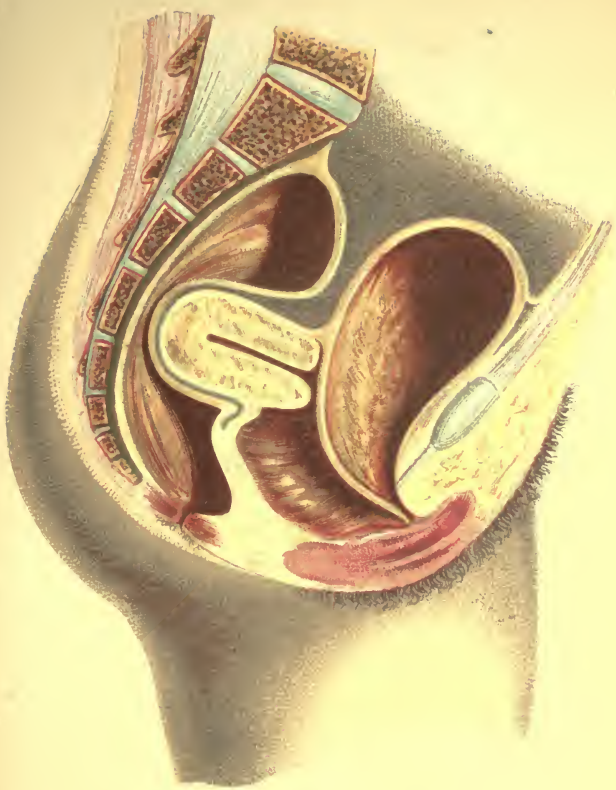
The great majority of the women who say that "they are in perfect health, and that they do not know why they have no children," are in exactly this situation; which, as I shall show hereafter, is curable in more than ninety-nine cases in a hundred, where no complications exist, or where no organic changes have resulted during

the many years which may have elapsed since the trouble commenced.

In certain cases, the interior of the cervix uteri shows more than this local irritation; there is marked ulceration, or this has passed still further, the ulceration has been cured, leaving in its cicatrization a diminution of the calibre of the canal, a local stricture of its whole course, or simply of the os externum, or the os internum.

A very generally present symptom of this condition of things is dysmenorrhœa. Pain in menstruation may occur from several causes; from ante-version, retro-flexion, &c., as already stated; but in far the greater majority of cases, it will be found to arise from the less serious difficulty—because more easily and surely curable—of local stricture.

Among the married, lacerations of the os and cervix in a first confinement are not unfrequently followed by subsequent barrenness. The accompanying symptoms being those of dysmenorrhœa, and the severest forms of uterine disease, profuse leucorrhœa, &c. Examination shows immense hypertrophy (in some cases the enlarged os becoming too voluminous to be entirely displayed at one view by a four-bladed speculum); the fissures, often two or three in number, extending an inch or two through the neck towards the body of the uterus, their edges uncicatrized, the whole observable organ highly injected, and the entire apparatus bathed in a profuse



and often fetid muco-purulent discharge. In the year 1852, I divided a cartilaginous cervix in order to effect delivery at the full time. (*Vide American Journal of Medical Sciences, July*, 1852.) The woman has never since been pregnant, and as she complains of these symptoms I do not doubt that a physical examination would evince the disorganizations above enumerated. I regret not being able to present a drawing of this condition, although it would doubtless appear exaggerated to any one not having noted its actual existence in nature.

Passing beyond this point, the cavity of the uterus proper has divers ills and affections, many of which are not yet fully, if at all, known.

I have noted, in the preceding chapter, that at the time of menstruation, the interior mucous membrane of the uterus undergoes a peculiar development, whether impregnation occurs or not, in order to fit it for the reception of the ovum.

In some forms of disease this action becomes a diseased one, and the consequence is, the so-called false membrane of dysmenorrhœa. On the contrary, this uterine development may be deficient from various causes, such as sickness, general weakness, local circumstances, &c. The defective or absent formation of this uterine mucous membrane is most probably a

frequent cause of sterility, especially if all the ordinarily observable conditions of menstruation be present. An egg is discharged normally, and may even be as regularly impregnated, but it meets no proper nidus in the uterus.

There are other internal difficulties which are swallowed up under the generic title of catarrh of the womb. This is of the same character as the affections of which we have been speaking, consisting of a slow inflammatory action, with the development of spots of profuse granulations, accompanied by the excretion of a muco-purulent fluid, or of blood, by excessive hæmorrhages at the menstrual period, at intermediate occasions of unusual fatigue, sexual excitement, &c. Acute local congestion, as in metritis, &c., is not unfrequently followed by chronic disease of this nature.

A more full development of these granulations, and their subsequent more or less perfect organization constitutes tumors and polypi of the uterus—affections already alluded to, but which in their full consideration do not enter into the plan of this work.

Inflammation of the womb, either total or partial, is sometimes though rarely followed by a partial or entire obliteration of the cavity of the uterus, from the adherence of the inner mucous membrane, lining it.

The womb is occasionally ossified. In the valuable collection made by Dr. John W. Francis, of New York,

was the ossified uterus of a woman who was never impregnated, four inches long, by about two-and-a-half in thickness. Ossifications of this organ in virgins are very rare, and we think no other case than this is known, although I have seen several uteri with their contents, a fœtus, &c., apparently near its full time, forming an immense ossified mass in the pelvis where it had remained for many years.

In rare instances there are found rupture, obliteration, strictures, and more or less severe inflammatory action in the Fallopian tubes. These diseases are more generally found at the two extremities of the tubes, because inflammatory action, the origin of all these difficulties, rarely arises from the middle of the tube, unless in consequence of some external violence and consequent injury, but, either from the uterus, or from the less passive portion, the fimbriated extremity.

Tyler Smith, in noting that the glandulæ nabothæ were present in the cavity of the cervix, the muscular walls of the uterus, and the broad ligaments, says: "I have repeatedly observed that in cases where the nabothean bodies are met with, small cysts are found in the course of the Fallopian tube, or at its fimbriated extremity."

Stricture of the uterine end of the Fallopian tube is supposed to be left as a solitary evidence of previous disease, and as thus isolated, we have had it described by some celebrated Europeans; but while we are ready

to recognize the fact that such local affection does exist, and the occasional occurrence of a fœtus being developed in the tube, authenticates it, we feel that except when some unusual dilatation or organic change in the os uteri co-exists, no method of exploration, can with any definite approximation at certainty, demonstrate its presence. Of this we shall speak more fully under the head of Treatment.

Disease, deformity, and misplacement of the fimbriated extremity may and do, not very unfrequently, present a fatal bar to fecundity.

Inflammatory action, as an acute affection originating in the extremity, is perhaps somewhat rare. Still, in common with the entire tube, and the entire genital apparatus, it is at regular monthly intervals subject to a turgescence and excitation which in consequence of certain untoward influences may take on irritative and inflammatory action, followed by occlusion of the patulous mouth ; first, by the extremities closing upon themselves ; secondly, by the extremities being agglutinated to the ovary ; thirdly, by the extremities being permanently fastened to some portion of the abdominal cavity at a distance from the ovary.

If the mouth of the Fallopian tube be permanently closed by the deposition of coagulable lymph, or the adhesion of its sides, nothing can by any possibility pass through it. Menstruation *ci dit* may occur, but the discharge will consist simply of the excretions from

that portion of the tube below, from the cavity of the womb, os uteri, vagina, &c. No ovum can, by any possibility, pass through any of these cavities.

If the extremity of the Fallopian tube, in its natural prehensile situation of clasping the ovary, be immovably attached, by inflammatory action either within itself or of the body of the ovary, a fortunate accident might cause a Graafian vesicle to be so located that it might in breaking, discharge its ovum directly into the ever ready mouth of the tube; but if the ovum be discharged either to one side or the other, it falls void into the cavity of the abdomen, where in most cases it perishes, is absorbed, and disappears.

Inflammatory action at some other than the menstrual period, may attack the fimbriated extremity, or a local inflammation from peritonitis, hernia, or external injury, may exist in the vicinity, and may not only withdraw the extremity from its propinquity to the ovary, but it may fill up the intervening space, or permanently fasten the extremity to some portion of the interior of the abdominal cavity remote from the ovary.

Small polypi may possibly exist in the course of the canal, as in all other mucous passages, although I do not know that any have ever been demonstrated as having been noticed, and small tumors, filling up the passage.

But a more formidable source of sterility, is the

forcible withdrawing of the fimbriated extremity from the ovary. Tumors may be developed and exist in the tube, or in the adjacent broad ligaments. These often grow to a large size, and the more or less accompanying inflammation may not only effect the disorganizations before alluded to, but also, merely mechanically in their growth, they may lift up and draw away the extremity from the possibility—left in a healthy state—of uniting with the ovary in its connected duties. Hernia of the ovaries may also isolate them from the reach of the fimbriated extremity.

These are not theoretical conditions, even if the ascribed results be fanciful, for I have seen, and doubtless many others are conversant with, such morbid appearance. A notable case was lately at the *Woman's Hospital* of this city, under the care of my highly esteemed friend Dr. Sims, where the tumor in its growth drew up the uterus, so that its fundus was distinctly felt, little, if any, above the natural size, midway between the os pubis, and the umbilicus, and springing from it, the ovary was distinctly recognizable through the abdominal parietes. Vaginal examination detected, as far off as could be reached, the os uteri, made doubly evident by the other hand being simultaneously placed on the fundus. In order that this state of things should exist, the neck of the uterus must have been necessarily materially elongated. If the fimbriated extremity remained in its normal situa-

tion, it seems scarcely possible that it could come into contact with the ovary at menstruation.

Finally, to finish the causes why sterility occurs ; the semen of the male or its vital principle may fail to meet the ovum of the female, from degeneration of the ovaries proper. In some instances, this organ is entirely wanting from congenital malformation, or it may be present, but so atrophied as to be powerless, or so disorganized, that the ovum itself is unformed. Previous inflammatory action, either acute or chronic, may have forever destroyed all efficient action on the part of the ovary. Henceforth it is an useless organ, and having no service to perform, it withers, becomes atrophied, and often but a trace remains. This condition is marked with the healthy aged ; less so, but still sufficiently perceptible, with the diseased young.

I attended a young girl in the last stages of an acute inflammation of the ovaries, where they had gone on to suppuration. One ruptured into the cavity of the peritoneum. A post-mortem showed that it was of immense size ; the abscess in the other was unbroken, and contained a quart of pus. This state of things was not necessarily fatal. Had she recovered, it would have been difficult for one to imagine a possibility, after such thorough disorganization, of subsequent impregnation.

Ovarian tumors of various characters, benign and malignant, dropsies, &c., often occur, which not only destroy the nature and powers of the ovary, but as in the case of tumors exterior to, and without the organ, draw away and alienate the ovary, so that the fimbriated extremity may not meet it, as above stated.

Even if there by chance remains a portion of the ovary uncontaminated by the disease, sufficient to eliminate a healthy ovum, the *locale* of the discharge may be incorrect, and the Graafian vesicle may perchance break into the sack containing the dropsical fluid, and thus be lost.

Chronic ovaritis is a form of disease much spoken of by certain writers, but one which I am inclined to consider of rare occurrence. I think that in most cases where such an affection is considered to exist before death, the difficulties are of a different nature, and when apparently discovered in autopsies, it is rather the disorganizations produced by, and subsequent to acute inflammation which are mistaken for the evidences of a chronic inflammatory state.

So, too, we hear of neuralgia (*Gibert*), and rheumatisms of the uterus and appendages, which likewise seem to be but long names given to obscure diseases, heretofore little known, to hide the real ignorance respecting their pathology.

And here, while speaking of the physical changes which are the cause of sterility, I will allude to one condition which is vaguely enough considered, both popularly and by the profession, to be alike the cause and consequence of barrenness. "Ah! she's getting *too fat* to have children," is a frequent remark; but that pinguidity should be opposed to fecundation is not yet proved, or why this condition should interfere with conception, has never been stated.

We know that when a woman has passed her grand climacteric, if spare before, she is quite apt to become fleshy subsequently; and this change has sometimes been supposed to result from the transformation into fat of the blood and fluids discharged monthly. True, we do not know how great a tax upon the animal economy it may be, to create that most subtle human extract—the ovum; but further than that we do know, that the quantity of blood, &c., lost at such periods, is entirely insufficient to form the fat or account for the great increase in flesh, when this flow is arrested.

More than this, the menstrual flow is not arrested in these cases, and is often increased with the increase in robustness, and some more efficient and probable evidence of its being a consequence of sterility, is wanted to make this view appear probable.

In many instances where fatness is present, the woman has had one or two children, and then the

sudden increase in size and weight ensues, and with it, subsequent barrenness!

I offer as a plausible reason, and leave it for those who are enabled to make autopsies, to verify the truth of the statement, that the deposition of fat in the abdomen around the intestines, genital apparatus, in the omentum, has an effect similar to that just mentioned, caused by tumors in that neighborhood. We all recognize the fact that the actions of the heart are manifestly impeded, and sometimes entirely arrested, by the deposition of the fat in and around it. I consider that the unusual deposit of fat around the uterus and ovary, not unfrequently bends down the Fallopian tubes, envelopes and obscures the ovaries, and offers an effectual barrier to the union of the ovum and the male fertilizing principle.

In some cases of extreme pinguidity, the deposit in the abdomen has had the effect of adding a great weight to the uterus, and to press this organ down into the pelvic strait, sometimes producing eversion, or so that the os uteri pressed upon the sacrum where, by mere friction, its surface became abraded, and profuse leucorrhœa ensued. Cases of this character I have seen not unfrequently. It is, however, among this class that the instances of incurable sterility come, and the reason given is to me a perfectly satisfactory one.

In certain of these cases it is evident that the sterility can proceed from none of these causes, because after

the administration of internal medicines intended to act as local excitants, conception has followed. The effect of these remedies could have been neither the unlocking of the fetters which bound down the Fallopian tubes, or by removing any of the interposed fat, but was limited in its action, to that of a local stimulus.

The only method of accounting for these cases is to suppose a loss of vitality in the organs, and consequently a failure in the evolution of the Graafian vesicle in the ovary.

We are aware that we have merely substituted hard words as a description of some unknown disease; but the plain fact is, that without any perceptible reason, no ovum is formed in, or escapes from, the ovary into the uterus—and to no other condition of things can be ascribed this actual untoward result. This form of sterility will be again referred to, under the corresponding head in the chapter on Treatment.

There is a popular belief among a certain class, that where a male and female are born at a twin birth, the female will be henceforward sterile. It is probable that this belief originated with the graziers, for it is stated as a fact that where a heifer and bull twins occur, the heifer will not conceive. Among cattle raisers, this heifer is called a "free-martin," and so

undoubted is the belief, that this free-martin is either killed as a calf, or if raised, is regularly broken to the yoke and worked like any ox. Many men of intelligence have made this statement to me, and it may be found in agricultural journals.

Among cattle such may be the fact, although I very much doubt it, but after a careful examination, I am convinced that such is not the fact in respect to the human race ; as I have known of numerous instances to the contrary, and do not now remember ever hearing one statement in corroboration of this opinion.

Prof. Simpson of Edinburgh, who has made considerable research upon this subject, acknowledges "the infecundity of free-martin cows to be a very general fact, but by no means an universal one." He has also collected the facts relative to the married history of 123 females born co-twin with males, 112 of whom had offspring, and 11 none, although married several years. "In other words, the marriages of the females born under these circumstances were *unproductive in the proportion of one to ten.*"

Sterility may be divided into two classes, the married female who has never had children, and she who has had one or more, but yet who has been barren for many years.

Congenital malformation or imperfection, of course

pertains exclusively to the first of these divisions. It is of very rare occurrence, for in general it, in both classes, arises from some of the diseases above enumerated; but occasionally natural physical imperfection is the origin. When this is the case, there is usually certain physical peculiarities and mental manifestations and idiosyncracies which will lead one to suspect the physical deficiency.

I have met with several cases of this character, where there was an absence of the uterus, or where there was evidently an uterus, but where there never was any menstrual secretion. One where I made a post-mortem of a lady nearly a century old, who had never menstruated or borne children, and where atrophy of the ovaries and obliteration of half the cavity of the uterus existed, and all had marked peculiarities of temper, feelings, and tastes. The maid who had never menstruated had suffered from various maladies, and was fickle and changeable in taste and manners. Both the others manifested no fondness for men's society; one married for a home; the other "went to parties to hear the music and to get a good supper;" both were excellent housekeepers; both were severe in their judgments of their friends, and had no compassion for "lovely woman stooped to folly." Neither of these two was squeamish in her actions, and possessed little delicacy or the soft attributes of woman. A recent case is reported by Dr. Baskette (*Southern Medical and*

Physical Journal, May and June 1855.) I merely hint at these peculiarities, to draw attention to them, and not with the design of giving any description of the cases; they having been reported in the *New York Med. Times*, and other journals some years since.

Tyler Smith says: "In general, the hair of the *mons veneris* is short and curled; but in sterile women I have sometimes observed it to be straight, and longer or shorter than usual—this condition being indicative of a feeble development of the internal organs of generation."

The woman barren from local disease, whether she has ever borne children or not, is characterized by other symptoms, which are clearly to be ascribed to some disease, viz., nervous excitement and depression, gastric irritations, with more or less desire for food, for unusual articles, even for indigestible and often disgusting things, hysterical urine, constipated bowels, irregular menstruation, often protracted and profuse, (occasionally very scanty), leucorrhœa, pain in back, &c., &c. The phases of the symptomatic manifestations of this condition of things are equalled only by the permutations of the ten cardinal numbers.

With these physical and mental manifestations of a local, plainly evident disease — the patient in her frequent paroxysms of nervous excitement, insisting ever and anon that she shall die or is dying—and the weary friends almost wishing, in their desire for a

moment's quiet and forgetfulness, that she would; the sufferer lingers out year after year, till some crisis, with its sure floodings, either reducing the sufferer by exhaustion to an early grave, or longer delayed, malignant disease, may seize the debilitated organ, and after a life of torture unutterable, loathsome and comfortless to herself and her friends, inevitable death made more cruel by delay, seizes its willing victim, rejoiced to be once free from anguish.

According to my own views, the reasons given for the want of fertility in the previous remarks, embrace all the causes that exist, but there are a train of causes alleged by other writers, and especially insisted upon by Roubaud in his recent work, *Traité de l'Impuissance et de la Sterilité, Paris*, 1855, and which I will therefore mention. They are classed under the head of "*Impuissance par Frigidité.*" Frigidity or want of sympathy in the sexual embrace, and an entire absence of sexual appetites and pleasures, from age, constitution, temperament, diseases (the effects of over feeding or drinking, masturbation, local disease, venereal excesses, &c., &c.).

I am convinced that but one question only is to be asked, viz. if healthy spermatozoa are brought into contact with healthy ova, to decide this question. Frigidity may or may not accompany the act; the result is as

independent of sensation, as if it were a chemical transformation that is going on.

Before leaving this branch of my subject, I will allude to two constitutional causes of sterility, the one is mercurialization, the other, constitutional syphilis. It is alleged that many persons who have been profusely salivated, and whose constitution still retains mercurial poison, are incapable of either generating or being fecundated. I cannot here discuss the question, but I doubt the fact of a person's retaining mercury in his system for any long period of time. I have seen many persons who had taken mercurials for various diseases, and who complained of its effects, and in my experience, these effects were attributable solely to the original disease not being entirely eradicated, and that a little more of the poisonous medicine so loudly blamed, entirely removed its supposed effects.

Constitutional syphilis is also supposed to be a cause of infertility, and with some show of reason, for it unquestionably does, in a degree, impair and paralyze the male semen; but in my opinion, in respect to females, it is more often a cause of early abortion, from an imperfect development of the ovum, than a cause of sterility, as it is difficult to decide whether the woman is ever impregnated or not. The menses are retained a few days over the usual period, there is finally a

somewhat profuse discharge, accompanied by more pain than usual, and the passage of what are considered clots, but in them lies concealed the semi-developed ovum—a condition of things like to that observable in those professional females who, by excessive intercourse so irritate the uterus, that it throws off its contents. These females not noticing any sign of pregnancy, imagine themselves barren, when they are on the contrary, subject only to repeated abortions.

III.

THERAPEUTICS OF STERILITY.

The previous chapters having been devoted to the Physiology of Generation, and to a description of those abnormal conditions and diseases, which in a greater or less degree retard or entirely interfere with this provision of nature for the continuance of our species, I come naturally to the third portion of my work, viz. the Treatment.

Successful Treatment and Cure are sometimes synonymous. They are so where the surgeon coaptates the ends of a broken bone, and restores the patient to pristine strength and vigor ; it is not so where he is compelled to amputate a diseased portion, and thus leaves the sufferer well in health, but mutilated and inefficient in power.

In the class of difficulties which we are now considering, in by far the greater proportion, the terms are synonymous. The actual disease bears small relation to the misery it entails, and in the vast majority of females it may be predicated that entire relief can be afforded. But two requisites may then be required

in order to subsequent fecundation, under proper influences. 1st.—That the female shall have attained a sufficient maturity, and yet may not have passed that term, after which conception is unattainable.

(This period can scarcely be measured by any particular number of years, inasmuch as its limit is the period during which menstruation occurs (sometimes, as before noted, unmarked by any external manifestations. In different climates this period varies. Probably 14 is the average age of first menstruation in this country, and 39 that of its complete cessation. There are strange exceptions however. A few years since I had a patient aged 21, the mother of five children at single full-timed births. I know another, married at 13½ years of age, to a boy 17½, and a mother at 14 and a few months, and that too, with no previous signs of menstruation, except the blood of the nuptial night.

A more remarkable instance was the precocity of a little girl, Phœbe Ann Baker, exhibited at Barnum's first baby-show. I saw her at my office, July 27th, 1855, and took the following notes. "Phœbe Ann Baker was born at Sing Sing, New York, January 19th 1851. Her mother has one other child, a boy of 7 years. Parents both American. At birth she weighed 14 pounds, and has always since been large. Dr. Hoffman being the attending physician. When 10 months old, a bloody flow was noticed from the puden-

dum, and this has continued periodically ever since, until the present date, without at any time going longer than six weeks (and when thus protracted showing signs of physical disturbance) without its appearing. About the time this flow commenced, a marked enlargement of her breasts was noticed, and they very soon attained to their present size, being now equal to those of most girls of 16 years, of perfect shape, having a well-formed, but not very protuberant nipple, and an areola of a light brown color. She weighs 64 pounds, and is of remarkable size for her age, fully developed in form, and of a maturity of appearance most noticeable. The hips are full, the limbs rounded, and her form would indicate that she had attained maturity and puberty." When I saw her as above described, this flow had been retarded for some two weeks longer than usual, and the mother seriously supposed her pregnant, as she had discovered a man (for which sex she evinced great fondness), in an improper situation respecting her, and she had arrested him, and he lay several days in prison on this charge. The flow, however, soon reappeared.)

2nd.—That no disorganizations have been effected in the progress or cure of the disease, which may preclude the possibility of a fruitful intercourse.

In expressing the results of my experience in the

treatment and cure of Sterility, I shall pursue the same plan adopted in the chapter on the Pathology of the disease, and commencing with the external vaginal opening, shall in turn take up each portion of the genital apparatus implicated, and follow it out, until the investigation shall ultimate in the ovary; and even farther, where no recognized pathological condition is present, to offer an answer to the query, why conception does not take place.

I have said that the semen of the male, or its fructifying principle, the spermatic filament or vesicle, may fail to enter into the vagina, or the uterus, or to come into contact with the uterus.

First.—From malformation of the vagina; and an imperforate hymen is among the most common causes, and is easily recognized. Theoretically, the most approved manner of treatment would be to divide it by a quadrangular incision, but practically, an opening made with a bistoury, an ordinary scalpel, or a lancet, in any direction, of sufficient size to admit the finger, will answer the purpose.

Brown says that the crucial or stellate incision ordinarily used, may be used upon the very young. This leaves the divided portion of the hymen to retract, and remain on each side of the vaginal orifice, and will create no irritation of consequence; but when the woman has passed her 25th or 30th year, the divided portions do not then shrivel or pucker up, and

vaginitis is apt to occur from the friction of these surfaces together, which may spread even to the peritoneum He therefore recommends that the hymen be removed entire by a circular incision at the point of junction with the labia.

If the organ be imperforate, the discharge of retained menses will be sufficient evidence that the work has been accomplished properly, and the incision has been made in a right direction. Should an opening exist in a firm and unyielding membrane, so strong as to have resisted the marital impulses, a probe-pointed bistoury will be the most available instrument to effect this purpose. Little topical treatment will be found necessary, unless the divided portions have a tendency to fall together, and there be danger of reunion, then a small piece of lint being placed within, cicatrization of the cut edges will soon take place, and it will be found that little impediment will exist to congress. Even then, gentleness and inunctions with some bland oil will be desirable, and ought not to be overlooked for its simplicity.

The cutting of this membrane is so entirely free from pain, bleeding, or any similar cause of fear, that any attempts at dilatation will be scarcely worth the delay consequent upon this method of relief. If, however, the idea of the knife is insurmountable, dilatation may easily be effected in the manner I shall shortly recount in cases of stricture of the vagina, or as

usually adopted in similar strictures of the urethra, rectum, &c.

The mechanical impediment of a contraction of the vagina, impeding and often preventing the perfect entrance of the male organ sufficiently to enable the semen to be ejected up to the os uteri is to be overcome by purely mechanical means. If the passage be a simple contraction without cicatrix or loss of substance, a bougie may be passed through the opening, and the passage may be thus gradually dilated, by increasing the size of the instruments, until it be sufficiently enlarged to admit of a piece of prepared sponge. Cones of this sponge should then be daily introduced, increasing their size as rapidly as possible, until the stricture be sufficiently overcome.

The most economical and convenient material for making the graduated bougies above referred to, is gutta percha, which, softened in hot water, will take any shape that may be desired, and may be changed as often as necessary.

Strictures which are the result of injuries, are more formidable, but still will admit of relief. Local injuries from sharp instruments, from falls upon stakes, producing lacerations and bruises, are often followed by great inflammatory action, resulting in sloughs, adhesions, &c. These separate cases, having peculiar causes

and conditions, can come under no general description. Each case must be treated according to its character, by dilatation with bougies, sponge tents, and by dividing the contracted cicatrices with the knife. In this class, which are the direct result of local injury, the astute practitioner will have little difficulty in applying the proper operation to the case, and effecting ultimately a beneficial result.

I have seen one instance where the entrance of the penis was prevented by a contracting of the passage, produced by a rachitic condition of the pelvic bones, so diminishing the passage, or rather rendering it so tortuous, that the erect penis could not follow its windings.

Pregnancy in such a case could only terminate with the greatest hazard to the mother, and it is fortunate that conception was thus rendered difficult, if not impossible. As the difficulty arose from a distortion of the ostia, and not from a bony tumor, any beneficial interference would have been impossible.

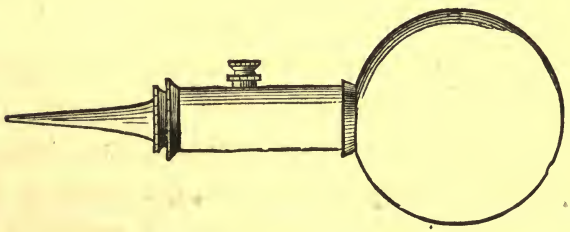
Extreme sensitiveness of the vagina not unfrequently produces so great suffering, that the female rarely admits the embraces of her husband, and then with such shrinking, as scarcely to allow the penis to enter into the vagina. Such a condition is generally temporary, and is the effect of a slight inflammatory action either of a benign or of a gonorrhœal character. When chronic, it is generally a consequence of the

acrid discharges connected with disease of the os uteri, to be hereafter spoken of.

Occasionally it has been recognized as proceeding from small tumors, exquisitely sensitive, which are located within or around the mouth of the urethra. It is sometimes necessary to divide the urethra, and to carefully dissect these tumors away from their sites, the most powerful caustics failing to give any relief. In other instances, where there is no local cause perceptible, relief has been found by the application of narcotics, very effectual among which is the aconite tincture. Marked benefit is also to be perceived from the local application of the vapor of chloroform.

I will here allude to the very marked benefit sometimes observed from the injection of the vapor of

FIG. 30.



chloroform in various uterine affections productive of pain, as dysmenorrhœa, rheumatic, neuralgic and other

troubles. Mr. Tiemann has constructed an instrument (Fig 30), peculiarly adapted for this purpose.

It consists of a tube in which is placed a sponge saturated with chloroform. An india rubber hollow ball at one extremity, upon pressure, draws air through a valved opening, and forces it, saturated with chloroform vapor, through the pointed extremity upon any desired locality. By placing one end of an elastic tube upon the valved opening, and the other being connected with a vessel containing chloroform, *pure* vapor may be injected.

Lately carbonic acid gas has been recommended by Prof. Simpson as a local anæsthetic, and which seems, from an imperfect experience, to be useful in some cases.

Ligatures are useless in the treatment of these rare affections, as they cannot be made to embrace the whole diseased portion, and in dissecting them away with the knife or sharp scissors, the mucous membrane to which they are attached, should also be removed, and the spot should afterwards be seared by nitric acid, applied upon a pointed stick, the circumjacent parts being surrounded by a piece of lint soaked in a strong solution of nitrate of potash. Mr. Brigham of the Lock Hospital, Manchester, advises the actual cautery.

Tumors in the vagina, in the recto-vaginal septum, the vesico-vaginal space, calculi, and various diseases affecting the bladder and rectum, may all render coition

impracticable :—their consideration does not demand attention in this connection.

The difficulties which prevent the semen from entering the uterine cavity, as already enumerated, are numerous.

Where there is chronic eversion of the uterus, pregnancy is impossible, for even if the uterus be restored to its natural situation, the character of the parts is so changed, that all hopes of future child-birth must be precluded.

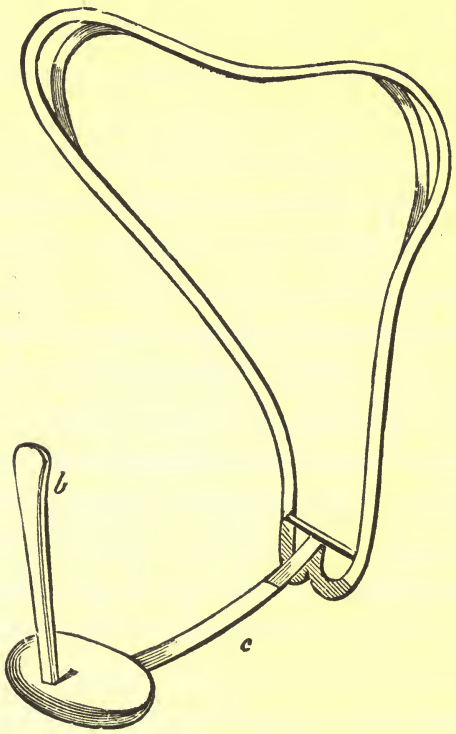
Ante and retro-versions are among the most troublesome forms of uterine disease, and, too, are far more common than has been supposed. When not of severe character, and when unaccompanied by other uterine disease, pregnancy, although of rare occurrence, is not impossible. I have witnessed three cases, in which abortion took place, in consequence of slight extra exertion, about the third month.

When recent, the displacement may be easily corrected ; mere recumbency upon the back will temporarily restore many cases of ante-version, which will return again after any considerable exercise.

The uterine sound passed into the os uteri, with pressure upon the fundus uteri by the finger through the rectum, will often restore a recent case of retro-version. When this displacement is chronic, the cure is also chronic, frequent introduction of the sound into the neck of the os uteri, allowing it to remain for a

considerable period daily in the cavity, until the internal surface has becamc accustomed to a foreign body, and then introducing Simpson's internal uterine supporter (Fig. 31), for an hour at first; gradually

FIG. 31.



increasing the time, until it can be borne constantly, I have known followed by great benefit, and finally effecting a radical cure. Great caution should be used, or inflammation will be excited, which will sometimes

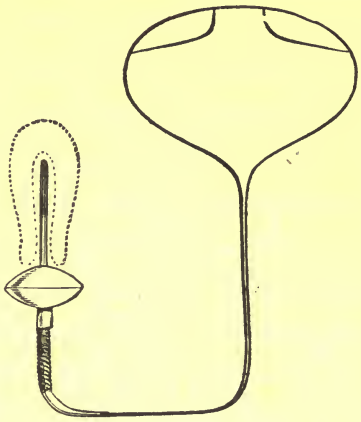
proceed to a dangerous extent. So warm and diverse have been the statements made respecting this instrument, that I consider it my duty to speak commendatorily of it in certain conditions, and in certain subjects. I assuredly, however, should not venture to apply it in cases where there was great uterine sensibility, at least until, by a course of training, the organ had been rendered less sensitive and impressionable.

One of the great objections urged against this instrument, is its rigidity, that it remains in a fixed position, irrespective of any change in the position of the body; that therefore it is frequently painful from pressure; that it is liable to effect immense injury to the wearer, should any accident or shock happen to her. To obviate these objections, Mr. Tiemann has modified the instrument by placing a spiral, gutta-percha covered spring at the union of the parts marked *b* and *c*, in Fig. 31, so that free motion is permitted to *b*, the stem, which is to enter the os. Another beneficial result is that, while the tendency of this spring is to keep *b* perpendicular, and thus to raise the uterus to its normal position, yet this is not forcibly and entirely accomplished immediately upon its introduction, but is, if the resistance be great, to be gradually effected by the constant action of the spring. The probability of injury from accident is also much lessened. This improvement is shown in Fig. 32.

Ante-version has occurred, and is often continued

from irregularities of the bowels, the rectum being allowed to remain filled with an immense accumulation.

Fig. 32.



In many cases, merely attending to this organ alone, is sufficient to restore the uterus to its natural condition. Certainly, no other treatment would be justifiable, until the regularity and effectiveness of the uterine discharges are fully established.

"An intestinal canal loaded with large fæcal accumulations, not only obstructs the returning circulation from the pelvic viscera, as is so commonly seen by its effects in producing an hœmorrhoidal habit, but by pushing down the uterus into the pelvis lower than is natural, for its venous circulation becomes also impeded, and considerable engorgement of the organ is produced." * * *

"Until this deposit is removed, we can scarcely be said to have ascertained the real extent of the local affection."—*Dr. E. Rigby.*

Retro-version has been caused by active exercise, or merely passive exercise in riding or the like, with the bladder over-distended with fluid. Such an occurrence, however, may be a cause, but the cause is not persistent, and its continuance is owing to other reasons.

Curious enough, the very producers of flexions and versions of the womb which I have described, have been recommended as curative agents. M. Hugier advises, in cases of ante-version, that the urine be retained as long as possible, and rarely, if ever, to be entirely evacuated, that by the bulk of the distended bladder, the obliquity of the uterus may be rectified. In the same manner, also, he advises the fæcal matter to be retained in the rectum, to restore the retroverted womb to its natural situation. I have no experience in this method of cure.

Tumors forming mechanical obstructions to conception, are principally polypi. When lying within, and low down in the vagina, they are usually of some size, and it is from their irritation and the acrid character of their discharges, that they can have much influence upon the generative functions. Their treatment must depend upon their variety. If possessing a distinctive

neck, and small in diameter, it can be easily surrounded by a ligature, and strangulated; if larger, a doubly-armed needle may be passed through the centre, and by tying each half separately, the circulation will be more effectually cut off, and the tumor thus destroyed.

According to my observation, the best form of ligature is wire of pure silver, which may easily be passed around and through the tumor, and *twisted.* It requires no knot, remaining firm and fast; it may be tightened more or less, as desired, and as often as desired, with little difficulty; is strong, cleanly and efficient. In most cases it will require no instruments, adjuncts, or accessories. When wire is not used, on the contrary, if high up, or wherever the tumor be situated, if it be requisite to tighten the ligature on succeding days, a canula will be absolutely necessary.

One of the easiest means of removing these intra-vaginal, or intra-uterine polypi, is by means of a little polypus forceps (Fig. 33), invented by M. Luer of Paris; the first of which I saw, was presented to me by the inventor and maker. The *museau de tanche* termination enables one not only to seize the tumor by a broad surface, but its interior grooved bite prevents any slipping. It will be found very effective in drawing down the tumor, when any operation is to be performed upon it. The rachet upon the handle will hold the instrument at any fixed point.

In many cases where it might be found difficult to

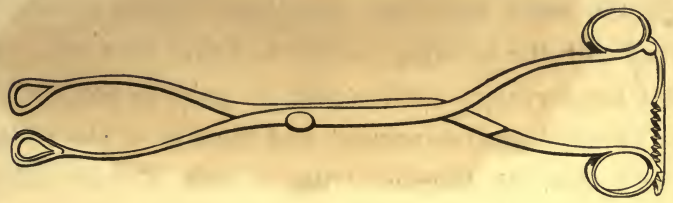
Fig. 1.

Fig. 2.

T. Sinclair's Chromo lith Phil^a

pass a ligature around the pedicle of the tumor, the pedicle itself may be seized by these forceps, and

Fig. 33.



compressed, and there retained by means of the rachet, and if desirable, they may be left hanging loosely, or supported by an attachment to a girdle, and worn until the tumor thus strangulated, falls off, a result easily obtained by the facility of increasing the pressure by the rachet-handle. These instruments are made of various sizes, and can thus be adapted to tumors of diverse magnitudes.

The minute polypi which spring from the cervix uteri, seem originally to have been but profuse granulations, which have become semi-organized. Bathed in a muco-purulent secretion, often enveloped in a clot of blood, they are very apt to be unnoticed. In all cases where a speculum examination is made, I am in the habit of carefully and thoroughly wiping the os uteri with cotton or lint, which will invariably expose the polypus, if without the cervix. But even when plainly before the eye, it will often be unnoticed by the care-

less examiner, from its diminutive size, and its resemblance in color and general appearance to the diseased surface around, with which it is in immediate contact.

The most effectual and best means for their removal is at the same time the speediest. They should be seized with the forceps, twisted and thus torn off. But little hæmorrhage results, and no pain is perceptible. The abraded surface around and the site of the pedicle should then be touched with a stick of pure Nitras Argenti, which will effectually restrain any further bleeding. This application should be continued weekly, till all disease is entirely healed.

Occasionally there is a large fungous growth within the cervix which may be the ovulæ nabothii in large quantities, or a profusion of vesicular polypi. Recamier invented a *curette* or scoop, with which he scraped out the os uteri, thus forcibly and roughly removing them. At present, this plan has few followers, and either the lunar caustic, or the acid nitrate of mercury is preferred to be applied, and thus more effectually to destroy them. In such a diseased condition of the cavity, the irritation from Simpson's intra-uterine pessary, is sometimes found to be serviceable.

When polypi are felt within a patulous os uteri, or when their presence is suspected from the hæmorrhagic discharges, the flaccid lips of the os uteri may be gently pressed asunder by means of the speculum os uteri (Fig. 28), or which is nearly as useful, by passing

the closed points of the vaginal forceps within the os, and then separating the handles, thus parting the lips, so that the eye may explore the cavity to some half-inch, or inch and a half.

If a polypus is thus discovered, the treatment should not differ from that already prescribed. More care, however, should be used when in this locality—from the difficulty of controlling any hæmorrhage that may arise—that no forcible traction or direct severance of the attachments of the polypus be made, but that gentle and careful torsion may remove it, and thereby the more surely prevent any bleeding.

Occasionally these polypi originate from the interior of the uterus, with the pedicle attached either to the fundus or lower down upon its interior surface. Often growing to an immense size, and productive of great danger when co-existing with a fœtus and subsequent labor, they are not only extremely prejudicial to health, but fortunately are usually preventives of pregnancy.

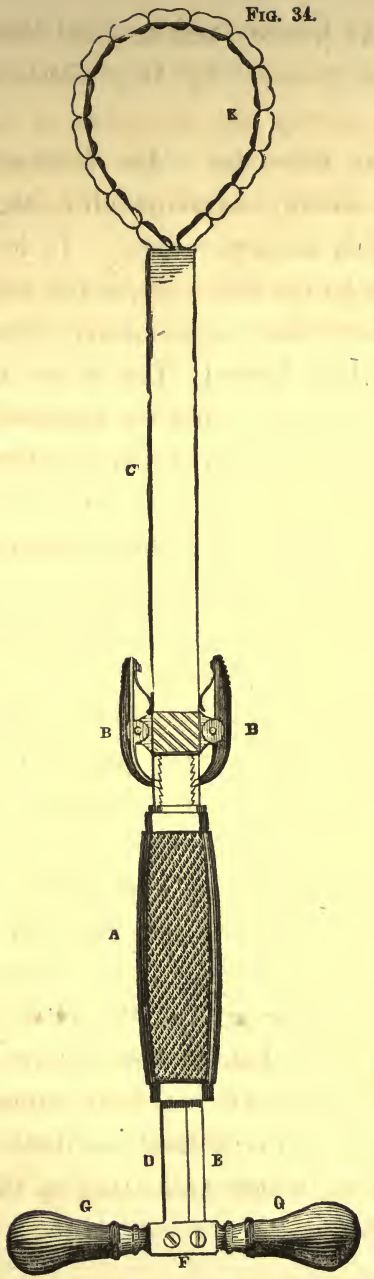
Great care is necessary in the treatment of these cases, the manner of which is greatly modified by the circumstances of the case, the condition of the patient, the hæmorrhagic or malignant character of the tumor, &c. Numerous interesting cases of this description are found in the medical journals and surgical treatises, and especially several remarkable cases reported, but not yet published, as treated by

Professor B. Fordyce Barker, and "*Sixteen Cases of Intra-Uterine Polypi*," by Dr. Walter Channing, of Boston, are worthy the attention of the student of these peculiar affections. Dr. Montgomery's monograph in the *Dublin Journal of Medicine, August* 1846, is full upon this subject.

The only essential difference in the treatment of this form of the affection, arises solely from its location being out of easy access. This is to be obviated by dilating the os uteri, so that manipulation may be effected within the cavity, or by the administration of ergot, until the uterine contractions shall so far expel the tumor from its cavity, that it may be seized and operated upon as deemed expedient.

Of late, less fears seem to be expressed respecting the bleeding from polypi. Dupuytren is reported to have had hæmorrhage in two cases only, in two hundred operations. In view of this fact, and in conjunction with the well-known injurious effects of allowing the putrescent mass to remain in the vagina, it is urged with much seeming force, that excision is proper in all cases ; some advising that the ligature should be first applied, and the mass dissevered below; and others recommending amputation, and the actual cautery to be applied to the surface of the wound. An ingenious method of performing this operation is to surround the neck of the polypus with the two insulated wires of a galvanic battery, which, on setting up the action of the

Fig. 34.



voltaic current, become red hot, cut through and sear at the same time.—(*Middeldorpf, Boston Med. & Surg. Journal.*)

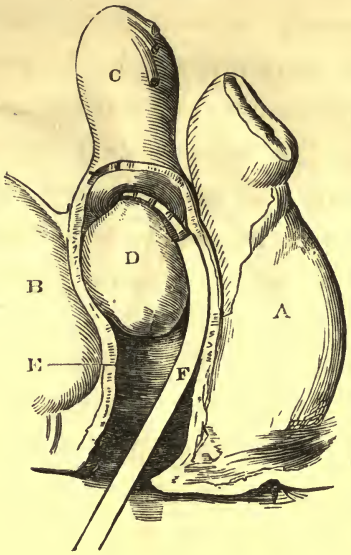
This method sears the edges of the wound, and the hæmorrhage usually accompanying the removal of these tumors is thus prevented. In hospital practice this plan may be feasible, but setting aside the trouble of transporting the large battery required for producing the white heat in the wires, the formidable appearance of so extensive an apparatus would form a serious objection among private patients of nervous susceptibilities.

M. Chassaignac, the distinguished surgeon of the Hôpital la Ribosière, Paris, has recently invented an instrument peculiarly appropriate for effecting the removal of these polypi of large size. The écraseur is the name given to this invention, shown in Fig. 34, because it breaks the parts, instead of cutting them asunder. The principle upon which the operation is performed is the well-known effect of torsion in restraining hæmorrhage, as exemplified in all crushed wounds. K is a blunt-edged chain, or metallic ligature, which passes through C, a canula, GG are the handles, by moving which, the chain is tightened. BB are two rachets, holding the chain as tightened.

In Figs 35 and 36 we have representations of enlarged polypi of the uterus, and both in process of operation for their removal. In Fig. 35, the polypus, D, is of small size. A, represents the rectum; C, the

uterus ; B, the bladder ; F, shows a curved instrument in E, the vagina, with the chain around the pedicle of

Fig. 35.



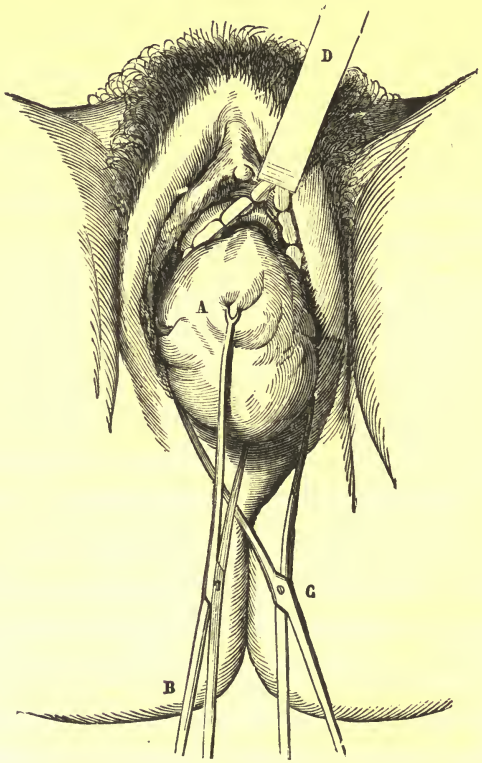
the polypus, just where it emerges from the os uteri, and in its natural position.

In Fig. 36, the polypus, A, is of larger size, so as to prevent successful operation within the cavity of the vagina. By means of forceps it is drawn and exposed to view, the écraseur, D, is applied, and almost instantaneously, it is separated from its attachment, the uterus returns to its normal situation, and no hæmorrhage accompanies or follows the crushing.

It is proper here to state that internal or constitu-

tional treatment is rarely, if ever, of any advantage in these forms of polypi ; the connection with the system

Fig. 36.



being of such a nature, that mercurials, iodine, or arsenical preparations, exert no apparent influence upon the tumor, while their administration adds a depraved and cachetic condition to the already worn and debilitated general system. The physical exhaus-

tion should not, on the other hand, be neglected, but by the proper use of chalybeates, tonics, and nourishing food, the drain upon the system should be met, and the physical energies supported. Astringent and antiputrescent lotions should counteract the local irritations.

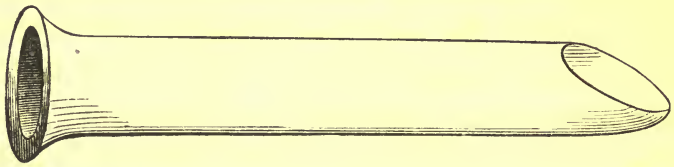
Should hydatids be recognized as present, the diseased mass should be broken up by the use of the sound, the uterus excited to action by the administration of ergot, by dilating the os uteri with the finger, or in such other manner as may be necessary to cause it to expel these unnatural contents.

Ulcerations are a very general, and most frequently unperceived, or even if discovered, unrecognized cause of sterility. In a previous chapter, this fact has been already stated, with sufficient minuteness. The apparent slightness of the cause is scarcely surpassed by the simplicity of its treatment.

With the speculum the diseased portion is plainly seen, as already described. This should be carefully wiped with a pledget of lint or cotton wool, that the whole surface be plainly exposed. In those who have never been impregnated, *i.e.*, where no injury could have been done to the os or cervix during any abortion, miscarriage, or labor at the full time, rarely is any fissure discovered, but a more or less extensive abrasion, or ulceration.

There is frequently much difficulty found in exposing the os to view, owing to various causes. One most annoying, is slight ante-version of the uterus, which brings the cervix into the cavity of the sacrum and the os, entirely out of the reach of the eye, and often almost of the finger. A new speculum, of French origin, is now manufactured by Mr. Tiemann (Fig. 37), the end of which is so shaped, as to catch the os in its

Fig. 37.



raised edge, and by slightly withdrawing the instrument, to bring the retained neck into view. The utility of this modification will be generally conceded by those engaged in treating uterine difficulties.

In the majority of cases, all that will be necessary to effect a perfect cure, is to touch this diseased surface with Nitras Argenti Purum. As the disease almost invariably, where of sufficient magnitude as to be the cause of sterility, is not confined to the visible portion, but is continued up the canal of the cervix, the caustic should be passed freely into this passage, to the extent of an inch or thereabouts—and this treatment should be repeated as often as the destroyed portion is cast

off, viz., in from five to seven days. During the interim, the vagina should be carefully bathed by a profuse injection of water, of such a cool temperature as shall be most agreeable. After the vagina is thus thoroughly cleansed, I am in the habit of prescribing a wash of a decoction of the Corticis Querci Albæ, ʒi, in a quart of water, to which, when strained, is added sufficient alum to saturate it. This has the double purpose of slightly stimulating the diseased portion, and by its astringency, contracting the lax parietes of the vagina, so that it may the more easily hold up the hypertrophied, and unusually heavy uterus. If there be any vaginal leucorrhœa accompanying, I have found most marked benefit, as well as in cases of simple vaginal flux, from the following:

℞. Ferrocyanuret, Potass, ʒ iv.
Aquæ Cinnamoni ℥ ii.
M. terendo.

Sume gtts. xxx. ter in die.

Other and more powerful caustics, such as the Acid Nitricum Purum; Hydrarg. Acid. Nit.; Potassæ cum Calce; Potassæ Fusæ, &c., I have found to be far more unmanageable, more dangerous, often productive of unpleasant results, and never having any superiority over the simple Nit. Argentum. The heroic treatment by the actual cautery, is, I think, called for by no condition of things. It is as unscientific as it is revolting.

In using these astringent internal injections, care should be taken in the time of their application, for the remarks made in previous portions of this volume will show, that the chemical character of these local applications will destroy the spermatozoa ; or even if simply mucilaginous or pure water injections be used, these will destroy in very many instances, the hope of offspring, by the mechanical washing away of the spermatic fluid. The time of using all injections, if of a chemical character, should not too closely precede copulation, neither if composed merely of pure water, should it soon follow the marital act.

In some cases I have found benefit after a longer or shorter continuance of the Nit. Argentum, in alternating with the Tinct. Iodini, and Tinct. Iodini Compositum.

In certain instances where the local sensibility was unusually great, I have applied the Acidum Tannicum dry ; to the abraded surface, and in a few instances, when used as a lotion, by means of a syringe, a saturated solution of Pulv. Boracis, benefit has resulted where the cases seemed previously almost stationary under other treatment.

In few instances I have used the Sub. Nitrat. Bismuth, applying it dry to the diseased portion, but usually with benefit. As in the use of Acidum Tannicum, I have applied it by dipping a pledget of lint into the dry powder, and thus conveying as much as

possible to the desired locality. The Bismuth has seemed to act by some mechanical irritation, in the same manner, and perhaps as effectually as when given by the mouth for dyspeptic symptoms or slight gastritis, but its effects being transient and evanescent, it is requisite that it be applied much oftener than the caustic, generally every day or two.

Frequently it will be found useful as a lotion applied with a syringe, the proportion being as follows.

℞. Sub. Nit. Bismuth, grs.	x.
Aq. Rosæ	ʒi.
Aq. Puræ	ʒv.

M.

Under these methods of treatment, the external ulceration is easily healed, but that of the cavity is not so speedily relieved. There is often every trace of inflammatory action, the redness, congestion, &c., removed, and yet a tenacious, transparent fluid—pure albumen—exudes from the orifice, which cannot be easily removed, and until it disappears, your patient is not well. The glands of the canal are preternaturally excited, and this flow, although of a normal character, save its too great viscidity, and profuse quantity, is the result of the over stimulation.

Sexual intercourse I do not find necessary to arrest, as its temporary natural stimulus seems, when not too frequent or excessive, to unload the congested glands

and to leave them in a condition more favorable to complete and speedy recovery.

Benign hypertrophy of the os uteri is invariably found to be but an accompanying symptom of internal cervical disease, and this phase will be relieved by the treatment above enumerated, one which will be found far preferable, and fully as effectual as Lisfranc's heroic treatment, excision of the neck.

I have not found it necessary or advisable to adopt the method proposed by Bennet, of making an issue by caustics upon the hypertrophied cervix, as, theoretically, I considered by so doing, I was treating symptoms, or at the best, secondary results, rather than the first prime cause. I have rather directed my attention directly to the *fons et origo*, the disease of the interior cervix, and have not found the objectionable issue even to facilitate the cure.

FIG. 38.

Scarifications of the hypertrophied cervix with a long knife are frequently of marked benefit. For this purpose an instrument (Fig. 38), with the blade sliding through a shield, is manufactured by Tiemann, which by means of a screw, enables one to set the knife at any required length, and thus to make the incisions to any depth.

When there is local acute congestion, or painful and scanty menstruation, relief is not unfrequently found by the application of two or three leeches to the cervix, through the speculum, care being taken not to allow them to escape from the leech-tube, as they sometimes crawl into the cavity of the os, producing great uterine disturbance, pain, &c. ; one instance of which is recorded by Dr. I. E. Taylor of this city.

In the same manner that after a chronic gleet, we find urethral stricture, so, after the subsidence of chronic leucorrhœa, the pathology of which we have endeavored to elucidate, we have stricture of the canal of the cervix. This stricture is, as already stated, located generally at either the os internum or the os externum. That at the external opening where its character is more observable, is sometimes apparently formed by the effusion and subsequent organization of coagulable lymph. This new matter does not take on the character of the tissue upon which it is located, but remains firm and inelastic. Dilatation is effected not by any stretching of the part but by its complete disruption. This is sometimes accomplished in the paroxysms of dysmenorrhœa and thus we account for the occasional instances of *fissures of the os uteri* observed in those who have never been impregnated, but which in a former work (*Treatise on Uterine Hæmorrhage in*

all its Forms, with some views respectimg Fissures of the Os Uteri, as a frequent cause of Abortion, with their Curative Treatment), I have considered to arise from an abortion, and to be afterward the efficient cause of the frequently repeated premature deliveries, abortions and miscarriages, with which some females are afflicted.

Lacerations of the os and cervix during labor, are not unfrequently the cause of subsequent barrenness, from causes already enumerated. The ulceration arising from the fissures is accompanied by immense hypertrophy of the os, and great leucorrhœal discharge. In one instance, an Englishwoman, who had been treated for ten or more years in England, having made many trips to Bath and Harrowgate and other springs, without relief, I found the os hypertrophied to a size more than three inches in diameter, and barely to be compassed by the fully distended four-valved speculum, with three extensive rents in its periphery, and all ulcerated and discharging pus. The hæmorrhage at the menstrual period was frightful. Similar cases I have spoken of on page 96.

The semi-transparent whitish lining of the os uteri plainly shows its fibrinous deposit, and the treatment here imperatively called for is incision.

Simpson recognizes this condition as a cause of dysmenorrhœa, and has presented an instrument with which to make the incision. I have preferred one of a simpler construction and of a more efficient character.

It is a probe-pointed knife with a short cutting edge (Fig. 39), which will be found to easily divide the projecting, hard-edged stricture, leaving the other portion unscathed.

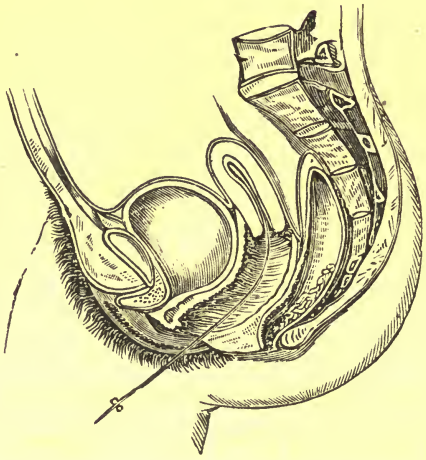
Fig. 39.

When this thin band is divided in two or more places, a probe may then be easily passed into the orifice, and if there be no superior disease, may be passed into the cavity of the uterus. A few topical pencillings with lunar caustic, and an occasional passage of a sound through the opening, and the cure is effected.

When, however, there is no fibrinous deposit, the stricture is dependent solely upon the contraction of the internal membrane, by the process of cicatrization. Perhaps the original disease may have been a syphilitic chancre. In any case, all that is present is a contraction without the addition, and probably without the subtraction, of any substance. Dilatation is the remedy. A probe of sufficient size should be passed within the small canal (Fig. 40), an ordinary male bougie, and often of the smallest size is all that can be made to enter primarily. This is to be followed up by larger ones. Simpson's Uterine Sounds, carefully graduated,

may sometimes be effectually used. Similar sounds may be made of gutta percha of such sizes as are

Fig. 40.



wanted, by heating the gum in boiling water, and will be found an economical substitute. These should be passed every two or three days, and allowed to remain when entered, for an hour or two, or until their presence becomes painful.

More effectual in my hands have been the prepared sponges. These are made by taking strips of fine sponge, about three inches in length, and an inch more or less in thickness, according to the size required, These are moistened in water, in which Gum Acaciæ has been dissolved. They are then wound closely and as firmly as possible with a cord, allowed to dry, when-

the cord being removed, they retain the shape into which they have been pressed, and after being trimmed smooth, are ready for use.

Fig. 41.

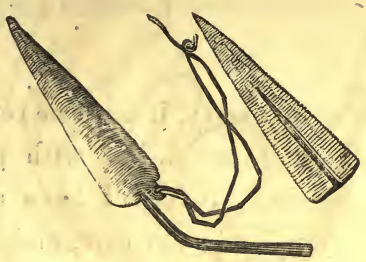


Fig. 41 represents a tent, to which a cord is attached, into which a firm wire (Fig. 42), is thrust, with which to insert it, by the side is a representation of the tent divided in its centre, and showing the cavity into which the wire is passed, to effect its entrance into the os.

Preparing the sponge of the size and length appropriate to the case, attaching a piece of silk to it, in order to favor its extraction, and the surface being carefully oiled, and either with the wire (Fig. 42), or seizing it with a pair of long forceps, it should be forced into the cervical canal as far as desired, if possible, and there left for twenty-four hours, or even longer, if it be not convenient to insert another immediately: during which time the sponge will, moistened by the secretions, expand to its natural size, and thus

dilate the canal. If left longer, a more profuse and fetid discharge is excited. Should there be any pain

Fig. 42.

so as to render it necessary, it must be removed sooner. Its presence is not incompatible with prolonged and even severe exercise. Indeed I have repeatedly had patients ride fifty miles in the cars, and return on the fourth day subsequently without any displacement of the sponge. The sponge should be enlarged in its diameter as fast as it can be, and until the canal be pervious during its entire extent, and of sufficient size. When once properly dilated, I have never known the os to again contract.

Recently, a proposition of doubtful feasibility has been made in the French Journals, to dilate the os uteri, by passing into it a long hollow tube of india-rubber, connected by a tube of the same to a bellows; by this it is to be blown up, and then stopped tight. From some experience with similar instruments in other situations, I doubt much its utility.

Dr. H. R. Storer has proposed in the *Boston Medical and Surgical Journal*, that tents made of Elm Bark, be substituted for those of sponge, stating that they

swell less rapidly than sponge, and thus do not make such sudden, and, as he thinks, injuriously rapid dilatation of the os and cervical canal, and also from their freedom from offensive smell, even when the discharge around is putrid.

During the continuance of this method of treatment, such vaginal lotions as may be required should be used, irrespective of this treatment, and if none are necessary, a simple bathing in pure water will be all that will be required.

When the stricture is midway, or affecting the entire length of the canal, or the os internum, the treatment does not materially differ, except that it is proportionally longer, the farther it is from the external orifice.

The anatomy of the interior membrane lining the os and cervix uteri, should be remembered, and the manner in which it is folded upon itself, constituting the arbor-vitae appearance, should not be forgotten.

The passing of sounds through the cavity of the cervix, is often a matter of considerable difficulty, and this not from the direct effect of the stricture, so much as the cervical rugæ which line the interior surface. The anatomy of the interior of a virgin cervix uteri, (Fig. 5), of the natural size, will be sufficiently demonstrated to elucidate this practical remark, by the accompanying cuts from Tyler Smith's Leucorrhœa. Figs. 43 and 44, show the longitudinal and transverse rugæ from the virgin cervix, magnified respectively

9 and 18 diameters. These reduplications of the mucous membrane lying in corrugated folds, are

Fig. 43.

created to effect the dilatation of the cervix uteri during labor, without laceration.

The end of the sound is not unfrequently caught in these rugæ, and in the mucous crypts and sulci, and

Fig. 44.

the operator may perhaps imagine that the stricture causes the resistance, which may be overcome by increased pressure, in doing which he will run great danger of lacerating the lining membrane, and of forming a false passage, thereby causing great subsequent inflammatory difficulty.

The probability of such an accident occurring may be seen by observing Fig. 45, which is a side view of one

Fig. 45.

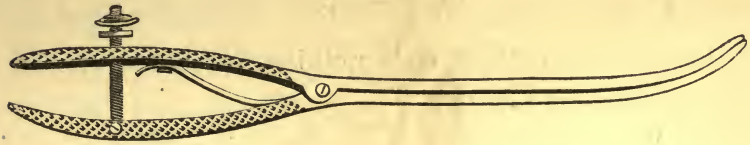
of the columns of rugæ and fossæ, magnified but six diameters.

Where there is a possibility of introducing an instrument through a firm stricture, dilatation may sometimes be forcibly made, by gradually separating the extremities of an instrument (Fig. 46), by means of a screw in the handle, and in certain cases this treatment will be found serviceable.

When the internal os is the seat of the disease, it is sometimes quite difficult to pass any instrument through it, or even to know if it is passed through,

and has entered into the cavity of the uterus. In one case, where a lady from the interior of New Jersey came to me weekly only, I was exceedingly troubled. The affection was easily recognized—the sound would

Fig. 46.



not pass in more than a half-inch. A smaller, and very fine pointed flexible bougie without a stylet passed in, however, but no such success could be attained when the stylet was introduced, or a large bougie attempted. Imagine my chagrin when, after several attempts, and with perhaps a trifle more force, I found that the end of the bougie was visible, and that it was but doubled upon itself, and had not probably passed any farther than the sound. In this case it was necessary to dilate the lower portion of the os, until it would easily admit the first joint of the index finger before it had any effect upon the internal stricture.

Dr. Sims of New York recommends in those cases of stricture, accompanied by diseased secretions, that a metal bougie be fastened within the cervix, and retained therein as long as it remains painless, to allow the diseased portion to cicatrize around it. The principle does not differ from the probe pessary of

Simpson, so ridiculed as the "impaler," from which, I have already stated, I have known marked benefits to arise.

After the treatment of the stricture is finished, the enlarged condition of the os and its patulous condition, the discharges, &c., speedily cease, the os resumes its natural appearance, menstruation is effected without pain, and the patient feels nothing which can remind her of the part affected.

Catarrh of the womb is, in other words, a chronic inflammation of its lining membrane, and generally accompanied by a greater or less co-incident uterine congestion. Its curative treatment is prolix and more uncertain than any other form of uterine disease. Quiet—the absence of sexual excitements—the use, sometimes, of a mild, alterative treatment, and injections into the cavity of the uterus of solutions of Nitras Argenti of various strengths, gradually increased in potency, have been the means usually found effectual in my practice. Often the monthly uterine congestion has, at its close, left the patient apparently no better than she was after the whole intervening month's treatment.

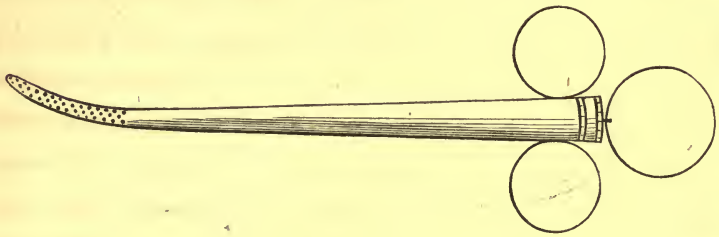
Occasionally excessive pain follows the injection, which I have relieved in some cases, by throwing in a similar quantity of olive-oil. Metritis is said to sometimes occur from this treatment. I have never

found actual inflammation, although I have sometimes feared it.

I have heard of cases where ovaritis followed its administration, and the reason supposed, was that the injection had been in such quantity and propelled with such force, as to pass through the length of the Fallopian tube.

A convenient instrument for this injection is a silver syringe (Fig. 47), which will not corrode, and is in every respect efficient.

Fig. 47.



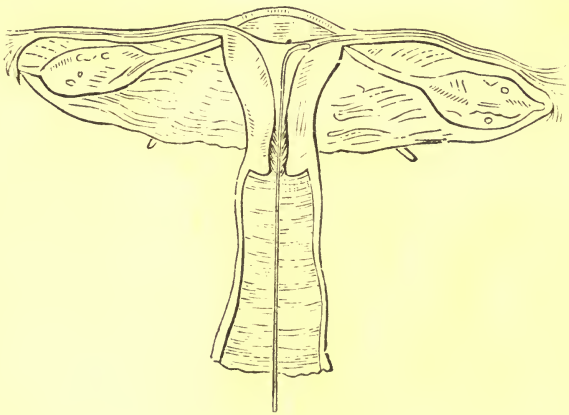
In these catarrhs of the womb, the Ferrocyanuretum Potassii, as before formularized, I have found of much benefit, the dose often being beneficially increased to double or quadruple its quantity.

Obliteration of the cavity of the womb, either general or partial, is with difficulty diagnosticated, if ever discovered, and even if its presence was really certain, it could not be successfully treated. I have

seen but one case only, and that of partial obliteration, of a barren lady who died at 94, already referred to, for her mental as well as physical idiosyncracies.

Disease and stricture of the Fallopian tube, and especially of the uterine end, to which reference has already been made: theoretically there is little doubt of its existence, but practically, there is immense doubt of the possibility of recognizing it, save, perhaps, in some exceedingly rare instances. The recommendation of some recent English writers, Tyler Smith the originator, of passing a bougie into the os, and through

Fig. 48.

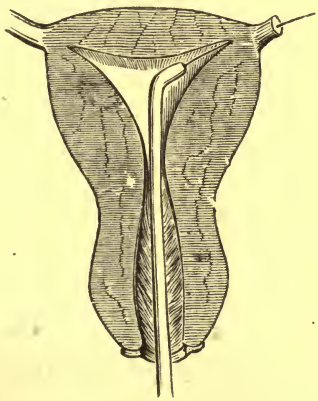


the cervix, and thence into the Fallopian tube, and by a series of graduated instruments removing this stricture, in the same manner that we have just recommended for the os and cervix uteri, is itself so seem-

ingly impossible, that it has scarcely been considered worthy of a thought by the profession, and the professor himself no longer urges it as a means of cure.

Fig. 49 represents another form of instrument, more resembling a catheter ; through the opening in the extremity of which a small probe may be protruded. These cuts (Figs. 48 and 49), serve to show the many difficulties which prevent the successful issue of this attempted operation. The impediments to the insertion of a curved instrument like that represented, through the os uteri externum and internum will be perceived by observation of them, and by reference to the difficulties of the passage of uterine sounds stated on page 151.

Fig. 49.



In the other diseases of the tube and fimbriated

extremity, enumerated in the pathology of the disease, the diagnosis, if possible, is obscure, and the treatment must be of the most vague and unsatisfactory character. We may hope that nature may effect some desired change, but from medicines or other forms of treatment we may not expect any beneficial result.

The affections of the ovary bearing upon sterility, are chronic congestion or inflammation, tumors from and of the organ, and a peculiar adynamic condition unmarked by any perceptible alteration, in its pathological character. The first of these diseases has a pathology, but with slight and obscure symptoms evincing it; the second is evident both before and after death; the third has abundant symptoms, but no pathological alteration in its tissues.

Chronic congestion is a sequela of acute inflammatory action, and is superinduced by numerous causes not necessary here to enumerate. It is often the result of interrupted menstruation, and is to be met by local antiphlogistic treatment; leeches to the abdominal region adjoining, sometimes, and particularly if any sympathy exist, to the os uteri; and a very mild alterative course. Especially is a loose condition of the bowels important, and an aloetic daily pill will be found

an important adjunct to such other treatment as may be necessary.

If the theory enunciated as to the manner in which a superabundance of fat prevents conception, be true, then the only method of accomplishing the desired end, is to reduce the plethora. If, however, the fat is but a result of the cessation of the functions of the ovary, from a failure in the evolution of the Graafian vesicle, topical stimulants are to be resorted to, and by no medicines have such beneficial results been attained, as by the internal administration of the Cantharis. This may be given in pill, powder, or tincture, beginning with small doses, and gradually increasing until its specific effects upon the mucous passages are plainly perceptible. The following formula may sometimes be found serviceable, where general stimulation is considered advisable :

℞. Pulv. Capsici	℥ ss.
" Zinziberis	℥ iss.
" Cantharidis	ʒ iiss.
Croci	ʒ iss.
Pulv. Caryophili	℥ ss.
Alcohol.	Oiiiss.
	M.

Dose ʒ ss to ʒ iii.

The administration of Cantharides is indeed empirical, for it is given without a due knowledge of the existing

condition, and also without an adequate idea of its method of action. It is presumed, however, that it stimulates, and even produces inflammatory action in the mucous passages of the kidneys, the uterus, the bladder, urethra, and the intestinal tract to some degree, and that the uterus and its appendages sympathize in this excitation, and the sluggish ovaries are provoked to new and vigorous action. Certain it is, however, that in many cases where no local or general disease is manifest, and yet where sterility is present, the administration of this medicine, is not unfrequently followed by pregnancy.

Dr. Mackenzie before the Med. Society of London, recently recommended Amorphous Phosphorus in certain affections of the uterine organs, attended with weakness and irritability of the nervous system—to be given in doses from 10 to 30 grains diffused in water. It appears to act as a direct tonic or stimulant to the uterine system. He had known pregnancy to supervene upon its employment, after a lengthened period of sterility, subsequent to marriage.

Raisers of stock have noted that high-conditioned mares and fat cattle do not readily breed, and they are in the habit of reducing the animal by copious bleedings and purges, before the male is admitted, and thus previously treated, the desired end is obtained. In several

instances where, acting upon this hint from the stables, a copious bleeding and free purgation followed the menstrual period, accompanied by a season of dietetic attention, conception has resulted, which had failed to be effected during many previous years of married life.

The application of electricity is sometimes of benefit in arousing the reproductive organs to their natural action. M. Roubaud in his recent work, states that he has had a greater success than most in the treatment of cases that I am now describing, where no disease is apparent. Indeed, he claims that in 6 out of 10 cases, particularly in those whose sterility proceeds from sexual abuse in prostitution, this treatment is followed by childbirth. The application is made once or twice a week for several months, during which time coition is suspended, and great simplicity and regularity in all the details of life are to be rigorously exacted.

In those cases where there is reason to suspect that the female may be tainted by syphilis, it will be found necessary to premise all other treatment by a constitutional course, and almost without exception, a cautious and protracted administration of mercurials will be

found advisable. Those mixed with Iodine in minute doses, I have found most serviceable. Particularly have I been pleased with the following preparation :

℞.	Chloridi Auri	grs. v.
	Hydrarg. Chlor. Corrosiv.	grs. i.
	Amyli.	ʒ ii.
	Gum Acaciæ Pulv.	ʒ ss.

M.

Et div in pil. no. LX.

Una ter in die.

Finally, infrequent coitus, and especially at seasons following soon after the disappearance of the menses, will be found important.

Conception is prevented and pregnancy interrupted by excessive intercourse with the married as with the courtezan, and if not so generally, at least, with sufficient frequency as to be noted and guarded against. The uterus, when too much excited, becomes irritable, and expels its contents. In animals it is noticed, and graziers are in the habit of throwing cold water over their brood mares and kine who are generally sterile, with beneficial results.

Pure air, quietude of mind, temperance in food, drink, and sleep—whatever conduces to general health and regularity of life, will be found advantageous, in conjunction with all medicines, and every variety of treatment. The cultivation of correct habits of mind and body can do no harm. They may not have the

desired result which is the object of these pages, but they will assist in cultivating a frame of mind and temper of spirit that will render the inevitable and incurable ill easier to be borne, and perhaps less regretted.

THE END.

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